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Vol. 2 July 26, 1946 No. 4

UNITED STATES DEPARTMENT OF COMMERCE

HENRY A. WALLACE, *Secretary*

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UNITED STATES DEPARTMENT OF COMMERCE
OFFICE OF TECHNICAL SERVICES

BIBLIOGRAPHY
OF SCIENTIFIC AND INDUSTRIAL REPORTS

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LIST OF ABBREVIATIONS

BELOW ARE LISTED ABBREVIATIONS USED IN BIBLIOGRAPHY FOR THE NAMES OF GOVERNMENTAL AGENCIES AND OTHER ORGANIZATIONS ISSUING REPORTS.

AAF	ARMY AIR FORCES.	NAVDOCKS	NAVY DEPARTMENT BUREAU OF YARDS AND DOCKS.
AFETO	ARMY FORCES IN THE EUROPEAN THEATER OF OPERATIONS.	NAVPERS	NAVY DEPARTMENT BUREAU OF PERSONNEL.
AFIBT	ARMY FORCES IN THE INDIA-BURMA THEATER.	NAVORD	NAVY DEPARTMENT BUREAU OF ORDNANCE.
AFMPAC	ARMY FORCES IN THE MIDDLE PACIFIC.	NAVSHIPS	NAVY DEPARTMENT BUREAU OF SHIPS.
AFMTO	ARMY FORCES IN THE MEDITERRANEAN THEATER OF OPERATIONS.	OPB	OFFICE OF THE PUBLICATION BOARD.
AFPAC	ARMY FORCES IN THE PACIFIC.	OPRD	OFFICE OF PRODUCTION RESEARCH AND DEVELOPMENT.
AFSPAC	ARMY FORCES IN THE SOUTH PACIFIC.	OSRD	OFFICE OF SCIENTIFIC RESEARCH AND DEVELOPMENT.
AFSWPAC	ARMY FORCES IN THE SOUTHWEST PACIFIC.	QMB	QUARTERMASTER BOARD.
AMC	AIR MATERIEL COMMAND.	QM	QUARTERMASTER CORPS.
ATI	AIR TECHNICAL INTELLIGENCE.	SCAP	SUPREME COMMANDER FOR THE ALLIED POWERS.
ATIC	ARMY TECHNICAL INTELLIGENCE CENTER.	SHAEF	SUPREME HEADQUARTERS ALLIED EXPEDITIONARY FORCES.
ATSC	AIR TECHNICAL SERVICE COMMAND.	SIG CORPS	SIGNAL CORPS.
BIOS	BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE.	TIIC	TECHNICAL INDUSTRIAL INTELLIGENCE COMMITTEE.
CHLOR-FAKO	CHLOR-FABRIKATIONS KOMMISSION.	WPB	WAR PRODUCTION BOARD.
CIOS	COMBINED INTELLIGENCE OBJECTIVES SUB-COMMITTEE.	ZETKO	ZWISCHENPRODUKTE KOMMISSION.
CPA	CIVILIAN PRODUCTION ADMINISTRATION.	ZWB	ZENTRALE FUR WISSENSCHAFTLICHES BERICHTSWESEN UBER LUFTFAHRTFORSCHUNG.
CWS	CHEMICAL WARFARE SERVICE.		
EEIS	ENEMY EQUIPMENT INTELLIGENCE SERVICE.		
FB	FORSCHUNGSBERICHT.		
FIAT	FIELD INFORMATION AGENCY, TECHNICAL.		
JDL	JAHRBUCH DER DEUTSCHEN LUFTFAHRTFORSCHUNG.		
JIOA	JOINT INTELLIGENCE OBJECTIVES AGENCY.		
NDRC	NATIONAL DEFENSE RESEARCH COMMITTEE.		
NAVAER	NAVY DEPARTMENT BUREAU OF AERONAUTICS.		

BEGINNING WITH THIS ISSUE OF THE BIBLIOGRAPHY OF SCIENTIFIC AND INDUSTRIAL REPORTS A LARGE NUMBER OF GERMAN PATENTS GRANTED DURING THE WAR YEARS WILL BE LISTED. NO PB NUMBER HAS BEEN ASSIGNED TO THEM. PHOTOSTATIC COPIES MAY BE ORDERED AT THE RATE OF 20¢ A PAGE FROM THE U. S. PATENT OFFICE, WASHINGTON 25, D. C.

CARTOGRAPHY

PB 23278. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 1. Aug 1943. 14 p. Price: Microfilm - 50¢ - Photostat - $1.00
Subjects discussed are: World polyconic grid; improved army map paper; modifications of the Bassist glue reversal process with formulae for sensitizer BG-1, hardening bath BG-2, and clearing bath BG-3; continuous tone on graphic film; excessive drying of plate edge on LTE press; and relative humidity. Chart for determining relative humidity from wet- and dry-bulb temperatures is included. These bulletins are issued periodically by the Army Map Service, Corps of Engineers, United States Army.

PB 23279. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 2. Oct 1943. 18 p. Price: Microfilm - 50¢- Photostat - $2.00
Subjects discussed are: Methods of computing and plotting grids, including diagrams, and nomogram for correcting grid distances; geographical names; preparation of copy for a "quickie" (monochrome edition of map from multi-color lithograph) by the mask method, the glue-tone process; color separation by masking; and prints by reflection. These bulletins are issued periodically by the Army Map Service, Corps of Engineers, United States Army.

PB 23280. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 3. Nov 1943. 16 p. Price: Microfilm - 50¢ - Photostat - $2.00
Subjects discussed are: Fluorescent map reproduction; contact screens with illustrations showing first maximum of diffraction patterns formed in photography through a glass screen, contrast control by the magenta contact screen, use of the orange contact screen, and Kodagraph magenta contact screen exposure guide for lithographic negatives; the new Plastolith process with formulae for sensitizer B-1 and etch B-3. These bulletins are issued periodically by the Army Map Service, Corps of Engineers, United States Army.

PB 23282. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 5. Jan 1944. 20 p. Price: Microfilm - 50¢ - Photostat - $2.00
Subjects discussed are: Ratio and approximate tilt determination for photo mosaics, including illustrations of the ratiograph; prime meridians and conversion of centesimal values to sexagesimal including a tabulation of the relations of the important prime meridians to Greenwich, and tables for converting centesimal values to sexagesimal values and vice versa; the defender varigram process; and direct reversals of film. The ratiograph is expected to be of vital interest to photo mapping units employing the radial triangulation method of establishing supplemental control. These bulletins are issued periodically by the Army Map Service, Corps of Engineers, United States Army.

PB 23283. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 6. Mar 1944. 20 p. Price: Microfilm - 50¢ - Photostat - $2.00
Subjects discussed are: Log scales and nomogram for determining tilt of rectifying cameras for unit magnification; mosaics by the "break-away" method for the compilation of standard size units of a photomap project in order of their priority where time and accuracy are the governing factors, including illustrations of method; cartographic film bases, topo acetate and vinylite; combination sepia and blueline boards; plate-making in Louisiana; and hydrometer conversion tables. These bulletins are issued periodically by the Army Map Service, Corps of Engineers, United States Army.

PB 23285. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 8. Jun 1944. 24 p. Price: Microfilm - 50¢- Photostat - $2.00
This issue of the Bulletins has been devoted to a comprehensive discussion of the construction of relief maps and topographical models, which during World War II found extensive use in the planning of operations, in assisting the immediate recognition of objectives, and in the training of personnel. Information on topographic models includes preparation of a mold, of plaster casts, and of rubber casts. The discussion of relief maps contains material on shadowgraphing and plotting backgrounds for scale models. The photographic processes involved in obtaining good photographs of models are touched on very lightly. Photographs and drawings illustrate the report. (See A.M.S. Bulletins, no. 14, PB 23291 for supplementary data.)

PB 23286. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 9. Jul 1944. 20 p. Price: Microfilm - 50¢ Photostat - $2.00
Four articles comprise this issue of the Bulletins: (1) The Chemistry of Dye-Coupling Development presents a comprehensive background of photo-chemistry extremely useful to a photographer especially in color work which is dependent upon dye-forming reactions; (2) Tips on Press Maintenance offers a few items on lubrication and cleaning, press operation, and repairs and adjustments which have substantially increased the dependability and performance of equipment; (3) Material supplementary to an earlier article, Miscellaneous Tables and Publications Dealing with Geodetic and Astronomical Operations, is given in New Table Replaces Five Five-Minute Intersection Tables; (4) Mathematics of the Ratiograph gives an analysis of the mathematical basis of the device.

PB 23288. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 11. Sep 1944. 24 p. Price: Microfilm - 50¢ - Photostat - $2.00
Subjects discussed are: A Standard Office Practice for map revision, based on a memorandum of the 649th Engineer Battalion's method of map revision at reproduction scale using film positives as the principal working medium; oxidation-proof zinc; and monochrome layer tinting. The following appendices accompany the article on map revision: A and B, Photo records; C and D, Operations orders; E, Job sheet; F, Photomapping edit; G, Check list for grid, grid data, projection and scales; and H, Revising multi-color sheets at the A.M.S.

PB 23289. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 12. Oct 1944. 20 p. Price: Microfilm - 50¢ - Photostat - $2.00
Subjects discussed are. The A.M.S. methods of tilt analysis; check lists for ink and printing troubles; some hints from the field on using the 300-line contact screen; and how to make halftone and straight line tint negatives. Photogrammetric research was undertaken by the Army Map Service, Corps of Engineers, United States Army, because of the need for a rapid semi-graphical procedure to determine the tilt of an aerial photograph. Descriptive geometric procedures are used in the constructions. The check lists on ink and printing troubles is reprinted from lists issued by the Fuchs & Lang Manufacturing Co. and the Harris-Seybold Potter Co.

PB 23291. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 14. Feb 1945. 31 p. Price: Microfilm - 50¢ - Photostat - $3.00
The construction procedures of topographic models described here cover the quantity production of rubber models. It is presented as supplementary data to that prepared by The Engineer Board, Ft. Belvoir, Va., on the production of topographic models and relief maps in plaster, a comprehensive discussion of which was presented in AMS Bulletins No. 8, June, 1944 (PB 23285). It is illustrated with drawings and covers the following subjects: Preparation of the master map and mosaic, contour cutting, modeling, mold making, casting, and painting; general information on rubber and compounding; how to distinguish acetate from vinylite and new AMS cutting marks, an aid to registration for field overprinting on trimmed maps.

PB 23292. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 15. Mar 1945. 24 p. Price: Microfilm - 50¢- Photostat - $2.00
Subjects discussed are: Use of reconnaissance photography in multiplex mapping equipment; how to make combination line and halftone negatives from original overlays called the Sandwich method; an "inching" device for the Harris LTE press; and the improvement of printed photomaps, how to blend the tones of light and dark prints in a mounted mosaic. Photographs are included.

PB 23294. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 17. May 1945. 35 p. Price: Microfilm - 50¢ - Photostat - $3.00
In the article The Control of Oxidation on Zinc, the printing, corrosion resistance, and unofficial field tests described establish the value of the Cronak Process in controlling the oxidation of zinc in lithography. Not only does this process make possible the use of zinc under extremely adverse printing conditions, but it improves the quality of reproduction as well. Photographs and tables are included. A procedure which increases the speed and accuracy of the preparation of a map showing romanized names as well as the Chinese ideographs for names of features is described in the article Chinese Type Available for Stick-Up.

PB 23299. U. S. ARMY MAP SERVICE. A.M.S. Bulletins, no. 22. Nov 1945. 20 p. Price: Microfilm - 50¢ - Photostat - $2.00
The conventional method of producing even screen tints in lithography suffers from many optical difficulties caused by the use of a lens, short bellows extension, and arc light illumination reflected from white paper. The new method described in the article, The Production of Even Screen Tints eliminates these difficulties by replacing the lens with stops, using a long bellows extension and tungsten light transmitted through a double diffuser. With the proper stops, correct screen distances, and careful processing, even screen tints can be produced of any desired printing density or pattern, including contact halftone screens. Diagrams and photographs illustrate the article. Short paragraphs on the following subjects are also included in this issue: Preventive maintenance of the Impression Cylinder Gripper Link in the Webendorfer press, the use of a solvent to swell blanket low spots, scum on edges of an albumin plate, and a definition and technique of etching.

CHEMICALS AND ALLIED PRODUCTS

Agricultural Chemicals

PB 25521. JENNETTE, W. V. and KUHN, H. A. The destruction of the cotton boll weevil by the use of toxic gases. (Edgewood Arsenal Chemical Div Rept 33) Jan 1921. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00
The tests consisted of exposing certain areas of infested growing cotton to a concentration of a certain gas and comparing the lethal action of the gas on both the weevil and the cotton. Chloropicrin, chloroacetophenone and arsenic trichloride were the gases used. The action of the above compounds was such that with the exception of chloroacetophenone, they could not be applied in even small quantities to growing plants without injury to them. If any appreciable amount be used, the destruction of the plant will result.

PB 22413. KILGORE, LOWELL B. Investigation of insecticide and insectifuge research and manufacture in western Germany. (FIAT Final Rept 38). Sep 1945. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
An investigation was made of the various methods for insect control in Germany. The study of the insecticide field revealed no new developments other than those previously reported by other investigators. Most of the work was with the DDT configuration and in this respect "Me 1700", "DDP" or "Lauseto" and "Gix" were developed. A few alkyl-aromatic sulfides and aromatic nitro compounds were found to be too toxic for warm blooded animals. The manufacture and testing of some of the insecticides is described. Tables list the action of many insecticides. A table shows the results of tests of fumigants with the Colorado beetle. A few insectifuges are considered, some of them being about as effective as phthallates. Nonphenol disinfectants, seed disinfectants, and thallium rodenticides are also considered.

Plastics and Plasticizers

German

PB 25648. GARTSHORE, J.F.C. and ROSE, J. D. Acrylic esters, synthesis from acetylene and nickel carbonyl. (BIOS Final Rept 358, Item 22) n. d. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report, together with its appendix and flowsheets, covers the synthesis of ethyl acrylate from acetylene and nickel carbonyl and the regeneration of the nickel carbonyl.

PB 27000. GREY, JAMES T. New plastics for German aircraft (structural materials, glazings, and paints). (FIAT Final Rept 762) Sep 1945. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00
Four organizations were visited in order to ascertain new developments in plastics, particularly structural materials, glazings, and protective paints. Professor Stauder of the University of Freiburg has concluded as a result of his studies that macromolecules with numerous short branches will produce the best results as adhesives. Professor Schmidt, a consulting chemist, explained his ideas on the mechanism of glueing with phenolic resins. His contentions that glues which coagulate bond efficiently and that foams must have fibrous supports in the cell walls are considered promising. The Holzverkohlungs-Industrie A. G. (H. I. A. G.) had developed, on a semi-commercial scale, a plastic material comprised of pentaerythritol and acrolein, which was considered as a substitute for Plexiglas, but was not adopted. Substituted amines had been successfully used for promoting the polymerization of methacrylic esters in the presence of organic peroxides. "Bits" comprised of sintered alumina had been developed for machining plastic materials. The items produced by Gustav Ruth were nitrocellulose dopes, zinc chromate primers, and anti-fouling paints. A new method of producing nonhydrolyzing anti-fouling paints through the use of inorganic complexes was described. Formulas for various coatings are given in an appendix.

PB 27486. PANARIELLO, VINCENT and others. German protective sheets, blue nylon type. (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 19, Appendix C) Feb 1946. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
Three samples of captured German protective sheets of the nylon type were examined. All three showed the same resistance to lewisite but differed in their resistance to mustard gas. Test data are included.

United States

PB 27102. KEBE, PAUL E. The evaluation of cast plastics and casting processes: Thermosetting resins, comparative evaluation of manufacturers' castings. Fifth progress report. (OPRD Res Rept W-218) Sep 1945. 13 p. Price: Microfilm - $1.00 - Photostat - $1.00
This report covers the work done in establishing a correlation between the physical test values of commercial casting resins as determined by the individual resin manufacturers and by the Curtiss-Wright Research Laboratory. The physical test values listed by the manufacturers have been duplicated with the following exceptions. The laboratory

was unable to duplicate the compressive strength values listed by (1) the Catalin Corporation for their Catabond #400 casting resin and (2) the Marblette Corporation for their #69 casting resin, and their #186 casting resin. In the case of Catabond #400 and Marblette #186, the discrepancies are not particularly significant. The laboratory was unable to obtain the maximum impact resistence values listed by (1) the Catalin Corporation for their Catavar #101 resin and (2) the Durez Plastics and Chemicals, Inc. for their #7421A casting resin. Comparison of the data here reported with those presented in the first two progress reports shows that, in most cases, the cure conditions recommended by the manufacturer do not produce the highest physical properties obtainable from the different resins. For other reports see PB 27098-PB 27101 and PB 27103-4.

PB 27103. ERBE, PAUL E. and HENDRICKSON, ETHELYNE E. The evaluation of cast plastics and casting processes: Additional thermosetting resins. Sixth progress report. (OPRD Res Rept W-219) 55 p. Price: Microfilm - $2.00 - Photostat - $4.00
The ultimate physical properties have been determined for several commercial casting resins of both the accelerated and the non-accelerated type. The casting conditions for the production of optimum physical properties for each of these resins have been evaluated. A thermoplastic resin-thermosetting resin combination was investigated. Each resin has a characteristic set of applicable casting conditions. The resins were not readily affected by changes in the amount of accelerator added, nor by changes in the time of cure. The temperature of cure was the critical factor involved in obtaining suitable castings. Differential shrinkage, that is, a difference in shrinkage of a casting along the length as compared to the shrinkage along the width, was encountered for all resins. Fillers did not improve the desirable physical properties of the castings. The thermoplastic-thermosetting combination produced no desirable properties that could not readily be obtained by direct casting. These data should serve as an introduction to the applicability of these resins in production tooling. Tables, graphs, diagrams and photographs are included. This is a progress report from the Research Laboratory of the Airplane Division, Curtiss-Wright Corporation. For other reports see PB 27098-PB 27102 and PB 27104.

PB 27099. GREY, JAMES. T. The evaluation of cast plastics and casting processes: Thermosetting resins, second group. Second progress report. (OPRD Res Rept W-217-B) Apr 1945. 58 p. Price: Microfilm - $2.00 - Photostat - $4.00
This report covers the extension of the work described in the first progress report to an additional group of thermosetting resins. The ultimate physical properties and the dimensional stabilities have been determined for several commercial casting resins of the accelerated type. These results were obtained from a preliminary evaluation of the casting techniques applicable to the resins. Each resin has a characteristic set of applicable casting conditions. If these conditions are not fulfilled, inferior castings result. The type and the amount of accelerator employed was the most important factors influencing the behavior of these resins. Fillers were found to modify the exothermic setting reaction in some instances so that useful castings might be obtained. These data should serve as an introduction to the applicability of these plastics in production tooling. Tables, graphs, sketches, photographs and bibliography are included. This is a progress report done under contract by the Research Laboratory of The Curtiss-Wright Corporation, Airplane Division. Previous and later work are reported in PB 27098 and PB 27100-PB 27104.

PB 27100. GREY, JAMES T. and others. The evaluation of cast plastics and casting process: Thermoplastic compositions. Third progress report. (OPRD Res Rept W-217-C) Apr 1945. 75 p. Price: Microfilm - $2.00 - Photostat - $5.00
The physical properties and dimensional characteristics have been determined on the following castable thermoplastics: Ethocel #200, #300, and #400; Promselt 14-285, 14-286, and 14-287; Thermo-Cast Soft, Medium, and Hard; Tenite II 201-A; and Plastalloy #6 and #9. A number of casting variables were investigated in order to determine their affect on the ultimate properties of the castings. The effects of post-curing, overheating, repetitive remelting, preheating the molds, reinforcing and aging have been evaluated. The casting variables affected each material tested in a characteristic manner seldom duplicated in the other products. Hence, each of the plastics has its own characteristic casting conditions. All thermoplastics had good dimensional stability with aging and all were subject to warpage when reinforced unsymmetrically. All castings which were repetitively remelted had a tendancy toward embrittlement. Tables, graphs, sketches and photographs accompany the article. This is a progress report done by the Research Laboratory of the Airplane Division, Curtiss-Wright Corporation. For other reports, see PB 27098-9 and PB 27101 - 27104.

PB 27098. GREY, JAMES T. and others. The evaluation of cast plastics and casting processes: Thermosetting resins, first group. First progress report. (OPRD Res Rept W-217-A) Mar 1945. 162 p. Price: Microfilm - $4.00 - Photostat - $11.00
The ultimate physical properties and the chemical and dimensional stabilities have been determined for four commercial casting resins, Catavar #101, Marblette #186, Durez #7421A, and Baker Casting Resin #100.972. The casting conditions for the production of optimum physical properties for each of these resins have been evaluated. Each resin has a characteristic set of applicable casting conditions. If these conditions are not fulfilled, inferior castings result. For the accelerated type resins these conditions are influenced by casting size. The non-accelerated resins require longer curing times and higher curing temperatures than do the accelerated resins and they also exhibit higher physical properties and greater after-shrinkage. The chemical resistance of the cast resins was excellent. The effect of fillers and special heat treatments have been evaluated. Fillers were found to effect the desirable physical properties, but insufficient data were obtained to definitely decide on their desirability or undesirability. Of the heat treatments, the post-curing annealing of the castings appeared beneficial for it decreased the shrinkage. Case hardening offered bright prospects, but this phase was not fully evaluated. These data should be helpful in designing production tools in plastics. Tables, graphs, sketches and photographs are included. This is a progress report done under contract by the Research Laboratory of the Curtiss-Wright Corporation, Airplane Division. For other and final reports, see PB 27099-PB 27104.

PB 27104. STERBUTZEL, GERALD A. The evaluation of cast plastics and casting processes: Effect of fillers on thermosetting resins. Final report. (OPRD Res Rept W 220) Oct 1945. 53 p. Price: Microfilm - $2.00 - Photostat - $4.00
The physical properties of Catavar #101 and Durez #7421A resin, incorporated with varying amounts of fillers, have been evaluated. The fillers used were apricot shell flour, Celite, Fiberglas flock, graphite and wood flour. The use of different stirrers, wetting agents and mixing techniques has been investigated. Each filler had its own characteristic effect on each resin. In every case the flexural strength was decreased. Where the decrease in flexural strength can be tolerated, the use of fillers should prove to be economically advisable. The use of vacuum in mixing proved very successful in improving the physical properties above the non-vacuum mixed runs. Tables, graphs, sketches and photographs are included. This report is from the Research Laboratory of the Airplane Division, Curtiss-Wright Corporation. For earlier reports, see PB 27098-27103.

PB 27101. STERBUTZEL, GERALD A. The evaluation of cast plastics and casting processes: Heat treatments of thermosetting resins. Fourth progress report. (OPRD Res Rept W-217) Sep 1945. 62 p. Price: Microfilm - $2.00 - Photostat - $5.00

The effect of case hardening, annealing and quenching on the physical properties of one accelerated (Durez #7421A) and one non-accelerated (Catavar #101) thermosetting casting resin has been evaluated. The skin effect, as well as the influence of case hardening on skin, was also evaluated. An oil bath for case hardening was found to be more suitable than either air or metal baths. The initial heat shock had a softening effect on the resins, but lengthening the time of treatment increased the hardness. Flexural and compressive strengths increased appreciably. Generally, annealing and quenching did not give favorable results with the accelerated resin, but their effect on the non-accelerated resin was beneficial. Tables, graphs and photographs are included. This is a progress report done by the Research Laboratory of the Airplane Division, Curtiss-Wright Corporation. For other reports, see PB 27098-PB 27100 and PB 27102-PB 27104.

Paints, Varnishes and Lacquers

PB 22998. FINKWEVER, A. J. Camouflage 302 exterior lime resistant emulsion paint. (Marine Corps Equipment Bd Test Rept 97, Preliminary). Jul 1943. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This paint appeared to give fair results on wood, but on metal it lacked adhesion. It was felt that this paint has only limited usage and does not afford any degree of protection on metal or wood against weather in hot humid climate. It has only limited usage in actual combat camouflage. It requires a special mixing container and lacks covering capacity.

PB 22475. NELSON, T. C. and KODET, K. R. Paint destruction and metal corrosion; Zoological aspects. Interim report 5, Feb 1 - Nov 1, 1944. (OSRD Rept 4512) Dec 1944. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
Visual observations have been made of coated glass and steel panels and uncoated steel panels immersed in sea water for various lengths of time at several locations along the Eastern Coast. Further evidence of anaerobic corrosion was obtained, and the type of paint destruction by barnacles and by oysters was observed. Oysters appear to affect only the surface of the paint, but barnacles gouged out the paint, sometimes completely penetrating the film. Photographs are attached. This is a progress report under contract with Rutgers University.

PB 22473. STARKEY, ROBERT L. and SCHMIDT, J. D. Paint destruction and metal corrosion: Microbiological aspects. Interim report 4: Feb 1 - Nov 1, 1944. (OSRD Rept 4402) Nov 1944. 59 p. Price: Microfilm-$1.00 - Photostat-$4.00
The major objectives of this project were, (1) The investigation of certain factors concerned with the corrosion of steel and iron in sea water, and (2) the influence of microorganisms and larger fouling organisms on the durability of paints. It is shown that anaerobic corrosion of steel is common and that both iron sulfide and sulfate-reducing bacteria are commonly associated with the corrosion products. Results indicate that the black sulfide is formed by anaerobic corrosion in which the sulfate-reducing bacteria are of major importance. Bacterial attack on common marine paints is evidenced by tests in closed containers where it was found that dissolved oxygen disappeared with simultaneous increase in bacterial numbers. Oxygen disappearance was not found in sterile samples. Bibliography is attached. This is a progress report under contract with Rutgers University.

Inorganic Chemicals

German

PB 27434. DEUTSCH, ZOLA G. and NEUBAUER, JOSEPH. A survey of the soda ash and caustic soda plants of western and southern Germany. (FIAT Final Rept 430) Nov 1945. 27 p. Price: Microfilm-$1.00 - Photostat-$2.00
Six German plants were visited. These were: (1) Kali-Chemie plant at Heilbronn which produces soda ash; (2) Deutche Solvay-Werke at Wyklen which produces soda ash; (3) I. G. Farbenindustrie plant, Oppau, which produces soda ash and NH_4Cl; (4) Deutsche Solvay-Werke at Rheinberg which produces NaOH; (5) Chemische Fabrik Koeln-Kalkmt, Cologne, which produces caustic soda; (6) Matthes & Weber plant at Duisburg which produces caustic soda and soda ash. A description of each plant's processes is given as well as analysis of their products.

PB 25034. HARANT, (Dr.) Method to produce hydrogen peroxide (H_2O_2). (BIOS Halstead Exploiting Centre Rept 5740). Nov 1945. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
This is a translation of a discussion by Dr. Harant on the production of H_2O_2. The discussion covers many of the methods and possible methods in Germany and each process is covered in some detail. The methods discussed are: (1) Barium peroxide and acid; (2) autoxidation of organic compounds; (3) persulfuric acid (Weissenstein Process); (4) potassium persulfate (Pretzsch Process); (5) ammonium persulfate (Riedel-Loewenstein Process); (6) cathode reduction (Berl Process); (7) Burning H_2 in O_2 or vice versa; (8) combination of H_2 and O_2 by silent electric discharge.

PB 25327. HAUFFE, KARL. On decomposition of T-stoff in presence of homogeneous catalysts. (BIOS Halstead Exploiting Centre Rept 10133). n.d. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
It was desired to find a homogeneous catalyst which will give a faster and more certain decomposition of "T-stoff" (85% hydrogen peroxide) which can be made in large quantities by means of vacuum distillation. The T-stoff could be used for driving turbines; but the use of a heterogeneous catalyst such as manganese dioxide and potassium permanganate caused a silting of the turbine blades with manganese dioxide. It was hoped that a homogeneous catalyst would prevent silting. The report describes results of tests with a few substances. A diagram of the testing apparatus is included. This is a translation of a German report on work done by Prof. Dr. Carl Wagener at the Institute of Physical and Organic Chemistry, Technical High School, Darmstadt.

United States

PB 22477. MATHERS, FRANK C. Investigation of methods of producing magnesium fluoride for the filming of lenses. (OSRD Rept 5449) Aug 1945. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
The results obtained indicate that in obtaining a satisfactory magnesium fluoride film on lenses, the heat treatment given the fluoride is more important than the purity. Fusion of the magnesium fluoride, regardless of its purity, will usually completely eliminate all sputtering or outgassing during the coating operation. The fusion can be carried out most easily in an induction furnace using a graphite crucible. The appendix gives a description of samples reported by Navy. This is a final report under contract with the University of Indiana.

PB 22472. NATIONAL RESEARCH CORPORATION, BOSTON, MASSACHUSETTS. Report of lithium research, Mar 15, 1943 - Dec 31, 1943. (OSRD Rept 3758) Jun 1944. 22 p. Price: Microfilm-50¢ - Photostat-$2.00
Three non-electrolytic methods have been developed for the production of lithium metal for the manufacture of lithium hydride: (1) direct vacuum thermal reduction of spodumene ore, at about $4.20 per lb., (2) the vacuum thermal reduction of lithium hydroxide obtained by calcining spodumene with CaO and leaching, at about $3.00 per lb., and (3) the reduction of Li_2O-CaO clinker produced by calcining Li_2SO_4-CaO mixture at about $2.50 per lb. Schematic flow sheets, costs diagrams, and comparative costs table appear in the appendix. See also PB 22481.

PB 27490. PANARIELLO, VINCENT and others. German Losantin 12 and drum. (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 26) Dec 1944. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
Two drums of Losantin 12 were tested. Losantin 12 is a stabilized bleach probably intended for storage without deterioration in temperate or tropical climates and utilized for decontamination purposes. This bleach compares with U. S. Grade III type of bleaching material, a semi-stabilized bleaching powder.

PB 25523. WALLIS, CHARLES H. The relation between activation temperature, moisture content and chloropicrin absorption of silica gel. (Edgewood Arsenal Chemical Div Rept 35). Feb 1921. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
The present work was undertaken with the purpose of investigating the following: (1) The effect of the water content of the silica gel upon its absorptive powers against chloropicrin; (2) the best temperature to be used for long activation. The following conclusions were arrived at: (1) A water content of 7% gives silica gel a maximum activity; (2) in activating large charges, the best gel would be obtained with a water content between 5.7% and 7.7%; (3) the activation should be controlled by analysis of the water content. Test results and activation curves are included.

Ordnance Chemicals

German

PB 25079. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Method of carrying out estimation of the acid adhering to the nitro-cellulose from centrifuges....Minutes of meeting of the Nitro-Cellulose Sub-Committee of the Special Propellant Committee at the Firm Wolff & Co. (BIOS Halstead Exploiting Centre Rept 3729). Jun 1942 - Nov 1944. 49 p. Price: Microfilm-50¢ - Photostat-$4.00
This report is a translation of four documents as follows: (1) Method of carrying out estimation of the acid adhering to the nitro-cellulose from centrifuges; (2) Decree by the Fuehrer that all means are to be taken to increase the efficiency of antiaircraft fire and the production of antiaircraft weapons; (3) Order for urgent production of 88 mm. incendiary shrapnel. This weapon, together with "Panzerfaust" to take first precedence; (4) Minutes of meeting of the nitrocellulose sub-committee of the special propellant committee at the establishment of Wolff and Company.

PB 25033. FLUEGGE. Pentaerythritol plant: Description of operation of the pentaerythritol plant in accordance with plan 'W' no. 1701. (BIOS Halstead Exploiting Centre Rept 5739). n.d. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translation of a report on the method of production of pentaerythritol together with flow sheet diagram of the plant process and equipment.

PB 25043. MANUSELER and FREIWALD. Research on explosives, based on hydrogen peroxide. II. (BIOS Halstead Exploiting Centre Rept 10128). Aug 1939. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translation of a laboratory report of research on explosives based on hydrogen peroxide. All mixtures examined showed multiple detonations. The chemical composition of the hydrocarbons mixed with the H_2O_2 influences the approach to the maximum velocity. Multiple ignitions are revealed through shock waves in the tube wall. Pure H_2O_2 only showed one detonation velocity up to the time of this report. Tables showing the brisance, densities and detonation velocities of the various fuel mixtures are included. Photographs mentioned in the report are not included.

PB 25031. I.G. FARBENINDUSTRIE, A.G. Product for the reduction of the heat of explosion of artillery powder. (BIOS Halstead Exploiting Centre Rept 5464). Jul 1943. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translation of a circular letter and two replies thereto regarding the problem of finding a suitable ingredient for artillery power to reduce the heat of explosion. In the circular are set forth the requirements of such a powder and the replies state what substances are suggested as possible ingredients together with the statement that investigations are in progress to discover suitable ingredients for the purpose named.

PB 27274. U. S. STRATEGIC BOMBING SURVEY. Powder explosives, special rocket and jet propellants, war gases and smoke acid. (Oil, Chemicals, and Rubber Div Ministerial Rept 1) Nov 1945. 292 p. Price: Microfilm - $6.00 - Photostat - $20.00
This report is a study of Germany's production of powder, explosives, and related products such as rocket and jet propellants, war gases and smokes. The study reviews the position of German production of powder, explosives, and related products, the expansion of productive capacities prior to the war, and the effects of Allied bombing and capture on the German output. Some of the exhibits included are: (1) Composition of German explosive and powder mixtures; (2) a flow sheet on the production of various explosives; (3) flow sheets on TNT production; (4) raw materials for the production of poison gases; (5) a diagram of the production of H_2O_2 by the persulfate process; (6) a flow sheet diagram of the Pietzsch-Adolph process for the production of 83% H_2O_2; (7) a flow diagram for the production of calcium and/or sodium permanganate (Z-Stoff N and Z-Stoff C respectively) from potassium permanganate by ion exchange; (8) various rocket fuels using 98% nitric acid. In addition an appendix reviews the explosives used by the Germans giving a brief outline of the preparation. The explosives include: (1) PH salt (ethylenediaminedinitrate); (2) MAN salt (methylaminenitrate); (3) Hexa (hexanitrodiphenylamine); (4) Myrol (methylnitrate); (5) POL powder (solventless cordite).

United States

PB 25532. BOUDER, M. M. The chemical properties of chloroacetophenone. (Edgewood Arsenal Chemical Div Rept 119). Mar 1922. 60 p. Price: Microfilm-$2.00 - Photostat-$4.00
The information in this report has been gathered from the technical files, from monthly project reports up to and including the month of March 1922, and reports submitted up to and including April 26, 1922. Bibliography.

PB 25531. BROWN, A. S. Method of preparation of ferric hydroxide gel absorbent. (Edgewood Arsenal Chemical Div Rept 65). Jul 1921. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
Investigations were continued on absorbents to replace either charcoal or soda lime in the canister. Among these absorbents is iron gel. The report describes the preparation of the iron gel. The absorptive activity of iron gel for chloropicrin and phosgene was found to be 31.8 minutes and 41 minutes, respectively, for the best sample. The service time against most gases is better than the best samples of soda lime. A table of the test with arsine, phosgene and chloropicrin is given.

PB 26933. CARTER, R. H. and KNIGHT, H. G. Fundamental study of toxicity. Solubilities of certain toxics in water and in olive oil. (Edgewood Arsenal Chemical Div Rept 445) May 1928. 24 p. Price: Microfilm-$1.00 - Photostat-$2.00
The solubilities of a number of toxic compounds in water and in olive oil were determined for use in calculations in connection with the program of research on the Fundamental Study of Toxicity. Determinations were carried out at 20° C. and at 37° C. Solubility, as used in this report, refers to the amount of solute which went into solution when a certain definite empirical procedure was followed. In case of hydrolysable compounds, the solubilities given include the products of hydrolysis. Solubilities are shown in summary tables.

PB 25577. COMLING, L. J. Smoke screens for large areas. Dispersion by candle. (Edgewood Arsenal Chemical Div Rept 480) Jun 1925. 69 p. Price: Microfilm-$2.00 - Photostat-$4.00
This report is a record of the work done on the development of a smoke analogous to that produced in the funnels of Navy destroyers by the incomplete combustion foil. A mixture was developed called the Nitar candle mixture, consisting of sodium nitrate (44%), saw-dust (11%), tar (40%), and sodium borate (5%). Variously sized candles apparently gave good results. At a comparative field test using Nitar candles and burning white phosphorus it was decided that the Nitar candle was of no practical use for the generations of smoke clouds for large areas.

PB 23158. FINKELSTEIN, L. and MAGRAM, S. J. Incendiary, TH, improved barytes thermit mixture as a substitute for Therm-8. (CWS Tech Div Memo Rept 407) Jul 1942. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
As a result of tests, it was determined that the improved barytes thermit mixture TH (iron oxide scale 59.2%, granular aluminum 92.5%, and barytes 15.5%) produced greater heat, used fewer, cheaper and more stable chemicals and was more simply manufactured than Therm-8. It was therefore recommended as a substitute standard for use in the M-54 bomb. Tables of test data and comparisons of the two types of bomb fillings included.

PB 27003. HARDY, JOHN and others. The estimation of moisture in solventless double base powders. (Calif Institute of Technology Rept 1052) n. d. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00
This paper is based on work done for the Office of Scientific Research and Development under contract with the California Institute of Technology. The work was performed at the Gates and Crellin Laboratories. Dessication, carbon tetrachloride distillation, and Karl Fischer procedures for the estimation of moisture in ballistite-type powders have been compared. Dessication over concentrated sulfuric acid has been found to be satisfactory with respect to accuracy and is also the simplest and most reproducible of these procedures, but under certain conditions the other methods are feasible for more rapid determinations. Description of procedures, tables, and bibliography are included.

PB 25517. HENLEY, F. M. and LEWIS, M. C. Report on preparation of adamsite. (Edgewood Arsenal Chemical Div Rept 23). Aug 1920. 25 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report covers the work accomplished in the laboratory concerning the manufacture of adamsite. 95 - 98% yields have consistently been obtained by condensation of molecular proportions of diphenylamine and 10% excess arsenic trichloride. The product has been good, having a toxicity comparing favorably with that produced at other sources. Instead of xylol crystallization, water washing has been substituted. Graining has been accomplished by slowly pouring the melted mass into rapidly agitated hot water. Tables showing results of various runs are attached.

PB 25506. JENNETTE, W. N. and KUHN, H. A. Report on lachrymatory power of samples of bromobenzyl cyanide from American University and Kingsport plants. (Edgewood Arsenal Chemical Div Rept 9). May 1920. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
The American University sample was seen as the more effective, the other sample being only 47% as lachrymatory. The method of testing is described.

PB 25530. KLOSKY, SIMON and STRICKER, PAUL F. The physico chemical constants of chloropicrin. Report 11. (Edgewood Arsenal Chemical Div Rept 61). Aug 1921. 22 p. Price: Microfilm-$1.00 - Photostat-$2.00
Practically all important constants are included in these data, save the heat of combustion. Formulas are given and curves of the vapor pressure and density are included. Bibliography.

PB 25516. KUHN, H. A. and ROCKWELL, P. O. Report on activity of nut charcoal after two years storage under varying conditions. (Edgewood Arsenal Chemical Div Rept 20) Jul 1920. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00
Samples of charcoal were taken from drums of activated nut charcoal which had been stored since the latter part of 1918. Tests showed that most of the charcoals were thirty minute charcoals. That which had been stored on the open platform had a high moisture content, about 20%. It was recommended that this charcoal be dried to about 5% or less before being used. Test results are given.

PB 26934. MACY, R. Fundamental study of toxicity. The rate of hydrolysis of certain toxics at definite pH values at 37° C. (Edgewood Arsenal Chemical Div Rept 446, Supp 1) Dec 1928. 15 p. Price: Microfilm-$1.00 - Photostat-$1.00
In connection with the work described in Edgewood Arsenal Chemical Division Report 446, it was desired to measure the rates on hydrolysis of several toxics at accurately controlled pH values, including a pH of 7.4 which obtains in the blood stream in the animal body. Eight toxic compounds were investigated for hydrolysis in water solution at ph values of 7.4 and 8.4. In one series of experiments the pH was kept at 9.4. The average results of percentage hydrolysis in 10 minutes for four toxics at 37° C. are shown in a table. These toxics are sym-dichloroacetone, ethyl bromoacetate, chloroacetone, and ethyl formate. The rate of hydrolysis of mustard gas could not be determined by the method employed because hydrolysis was complete in the time required to dissolve it.

PB 26947. MILLS, J. E. Fundamental study of toxicity. General summary, revised. (Edgewood Arsenal Chemical Div Rept 458) Jul 1932. 135 p. Price: Microfilm-$3.00 - Photostat-$9.00
This report reviews and summarizes the work done on fundamental toxicity which was reported in Edgewood Arsenal Chemical Div Reports Nos. 373 and 441 to 457 inclusive (see PB Nos. 25357 through 25361, 25363, 25575, 25576, 25806, 26933 through 26946). Progress has been made in formulating a general theory of toxicity. Generalizations have been expressed in formulas which may be found in the body of the report. It is the opinion of the investigator that the methods outlined have great value in the development of new medicinal compounds and in the field of general therapeutics. The main purpose of the investigation was to find a means of predicting in advance the true toxicity of a chemical compound and its method of action. The investigator states that the work summarized in the report has confirmed certain generalities by the use of which the search for new compounds may be freed from much of the uncertainty and extravagance of blind guesswork and placed on a basis of scientific research.

PB 27164. ROSEN, EDWARD J. and GILMONT, ROGER.
Heats of combustion and formation of diethylphthalate, dibutylphthalate, dinitrotoluene, diethyldiphenylurea and nitroguanidine. (NDRC Armor and Ordnance Rept - A-197; OSRD Rept 1590) Jul 1943. 14 p. Price: Microfilm-$1.00 - Photostat - $1.00
This report gives the results obtained in a thermochemical investigation by the National Bureau of Standards for the National Defense Research Committee on the determination of the heats of combustion of five substances used as constituents of military gunpowders. Values are given for the heats of combustion and of formation of diethylphthalate (liquid), dibutylphthalate (liquid), dinitrotoluene (solid), diethyldiphenylurea (solid, "ethyl centralite"), and nitroguanidine (solid, "picrite"), as produced for use in ordnance work. Test data and bibliography are included.

PB 25514. ROCKWELL, P. O. and KUHN, H. A. Report on Barneby-Cheney charcoal. (Edgewood Arsenal Chemical Div Rept 18). Jan 1920. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00

Three samples of charcoal were submitted for test. Their absorptive activity, mesh, and moisture content were determined. The activity of the charcoals was measured on an apparatus similar to the accelerated chloropicrin machine. The service time of one sample was found to be about 28% less than the other two charcoals. The latter two samples may be rated under standard absorption tests as 60 minute charcoals. Test data and graphs included are in report.

PB 25520. ROCKWELL, P. O. and KUHN, H. A. Report on deterioration of soda lime during two years storage. (Edgewood Arsenal Chemical Div Rept 32). Nov 1920. 37 p. Price: Microfilm-$1.00 - Photostat-$3.00
The phosgene service time decreased 20% or more (as compared with the previous average) on five of the twelve samples tested, causing their rejection, the remaining seven samples showing less than 20% decrease in life. The sodium hydroxide was partially converted to the carbonate. This might decrease the phosgene life as run (stressing activity) but not the capacity of the absorbent. The moisture content is practically unchanged. The granules show an average deterioration of 50% of previous life on arsine. The available permanganate content of three samples is less than 90% of the required 1.8%. Tables and graphs of the test results are included.

PB 25513. ROCKWELL, P. O. and KUHN, H. A. Report on Navy charcoal. (Edgewood Arsenal Chemical Div Rept 17). Jul 1920. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
Two charcoal samples, "Coarse B" and "Fine B" were tested for absorptive activity with the accelerated chloropicrin test. Charcoal "Coarse B" is very poor absorptive charcoal as it has a life of only 1.7 minutes on a ten centimeter depth and zero life on a five centimeter depth. The screen analysis does not approach an 8 or 9-14 mesh charcoal, 90% of it is 4-6 mesh. Charcoal "Fine B" is over 25 minute charcoal on the accelerated chloropicrin test, but 80% of it is finer than 20 mesh. Neither sample fulfills the requirements as to mesh and life required by standard specifications for toxic gas absorbent charcoal. Tables of test results are included.

PB 25524. ROCKWELL, P. O. and KUHN, HARRY A. Second report on National Carbon Company charcoal. (See also EACD report 31). (Edgewood Arsenal Chemical Div Rept 38). Apr 1921. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
It was desired to measure the absorptive properties of grade four charcoal from the National Carbon Co. and to compare the same with previous samples. The life against chloropicrin, phosgene and arsine, the apparent density and the moisture content were determined. The present carbon is considered better than the previous samples. It has a shorter chloropicrin life but its arsine life is three times that of the former sample from the National Carbon Co. Test data and the arsine and phosgene curves are included.

PB 27004. VAUGH, THOMAS D. and others. An improved volumetric bromination procedure for the determination of some aromatic amines and substituted ureas in smokeless powder. (Calif Institute of Technology Rept 1056) n. d. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
This paper is based on work done for the office of Scientific Research and Development under contract with the California Institute of Technology. The work was performed at the Gates and Crellin Laboratories. The volumetric bromination procedure which is in general use for the estimation of stabilizers in smokeless powder has been modified by the use of glacial acetic acid as a solvent for the sample to be brominated. The modified procedure is more convenient than the standard procedure in which carbon tetrachloride is used in a two phase system, and less dependent on conditions of bromination than the standard procedure in which alcohol is used as the solvent. Tables and bibliography are included.

Analytical Chemistry

PB 27461. PANARIELLO, VINCENT and others. French gas detection kit. (CWS 40th Chemical Lab Co. Captured Material Tech Rept 60) Apr 1945. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
This kit was to be used in the field. Eleven items were contained in the kit.

Miscellaneous Chemicals

German

PB 20078. COPELAND, M. A. and YOUKER, M. A. German techniques for handling acetylene in chemical operations. Vols. I-III. (FIAT Final Rept 720) Jan 1946. 238 p. Price: Microfilm-$2.50 - Photostat-$16.00
The purpose of this report is to present the advances made in recent years by the Germans or, more particularly, I. G. Farbenindustrie in the technique of handling acetylene in chemical operations. This includes the research work done to establish the conditions under which acetylene undergoes explosive decomposition, how these data were used to design plants and set up operating conditions, and subsequent experience in these plants. Most of the processes described have been discussed in other reports so that they are considered primarily from the point of view of acetylene handling techniques. Some of the older and better known processes have not been included. Acetylene will under certain conditions decompose explosively to carbon and hydrogen with release of considerable energy, viz., 53,000 kg. cal./mol. of gas. It has been known for a number of years in a qualitative way that decomposition is affected by a variety of factors, the principle ones of which are pressure, temperature, type of ignition, concentration of the gas, size of the containing vessel, etc. Because of the increased tendency toward decomposition with increased pressure and temperature, chemical operations utilizing acetylene have always heretofore been carried out at moderate temperatures and pressures. For the same reason acetylene generators are in most countries not operated over a pressure of 1.5 atm. gauge, because of the number of explosions which resulted at higher pressures. Decomposition in such generators is caused by local overheating of the carbide. Acetylene may decompose in essentially two different ways. The spread of decomposition may be relatively slow and the resulting pressure rise gradual as in the usual processes of explosion or combustion or it may be extremely fast, i.e., a detonation. Actually, the latter represents the limiting speed of the former. The maximum final pressure (assuming no heat loss) in the case of the slow type of decomposition can be calculated from the energy released and is approximately 12 times the original. In the case of a detonation the ratio of final pressure to initial may be many times this factor. Equipment can be designed to withstand pressures developed by slow decomposition, but it is usually impractical except for very small vessels to design equipment to withstand detonations. In the early history of acetylene production, many accidents occurred until proper techniques of compressing and storing the material were developed. It can be compressed in slow-moving reciprocating compressors by stages with proper intercooling up to 15-20 atmospheres. The storage cylinders are filled with a porous material, for example kieselguhr, and the acetylene is absorbed in acetone which is also added to the cylinder. Small lines are employed for the most part. Most of the present technique has been developed on a rule of thumb basis over a period of years, and the knowledge so accumulated has been of limited assistance to the chemist or chemical engineer desiring to use acetylene as a raw material under wholly different conditions. Since Germany did not have petroleum resources, acetylene, which could be produced from raw materials readily available, played a large part in Germany's program of self-sufficiency in the chemicals industry and was used as the starting material for many organic compounds. Work on acetylene chemistry was intensified just prior to, and during the war. Many of the processes developed required the use of acetylene under conditions not heretofore considered possible for safe-

ty reasons. Among the processes which are interesting because of the rather drastic conditions under which acetylene is handled are the following: 1. The purification and concentration of arc acetylene at Hüls by absorption in water at 18 atm. pressure. 2. Manufacture of butynediol on a large scale using acetylene in the presence of copper acetylide (usually considered a good detonator) at a pressure of 6 atm. and a temperature of 110° C. 3. Production of Koresin, a tackifier used in building of tires of Buna rubber, by the condensation of acetylene and p-tertiary butyl phenol at 20 atm. and 200° C. 4. Production of vinyl pyrrolidon, the polymer of which was used by the Germans as a substitute for blood plasma. This involved direct vinylation at a pressure of 20-25 atm. and a temperature of 150° C. 5. Vinyl ether manufacture utilizing pressures of 20 atm. and reaction temperatures of 150-170° C. to react C_2H_2 with alcohols.

Added to this report are individual reports of the significant work investigated by the foremost German researchers on acetylene chemistry, photographs, graphs, tables and schematic flow charts (some of which have been translated and reproduced in better form) and the actual process descriptions of processes as carried out at Hüls.

PB 22444. DUTCHER, R. ADAMS. Chemical Institute, Heidelberg University. (FIAT Evaluation Rept 1064; FIAT Final Rept 76) Sep 1945. 3 p. Price: Microfilm - 50¢ - Photostat - $1.00

This report describes briefly the investigation of the work of Dr. Karl Freudenberg and his associates. For the last few years, he was concerned with the attempt to determine the constitution of lignin. Lignin was readily hydrogenated by heating in autoclave in an alkaline solution with chromium salts as catalysts. Lignin-like compounds were made by the dehydrogenation of iso-eugenol, 2 mols combining to form dehydro-diisoeugenol. He feels that lignin formation in the plant may be brought about by dehydrogenase enzymes causing phenol compounds or similar compounds to form characteristic furane-ether ring structures. He has used dehydrogenase enzyme preparations made from fungi to cause phenols and phenolic acids to react. When these are buffered at pH7 and aerated, lignin-like compounds are formed. Dr. Freudenberg notes that the refractive index of wood components is identical with that of the eugenols. A list of some recent publications by Dr. Freudenberg and his associates is appended.

PB 25649. GARTSHORE, J.F.C. Notes on manufacture of ethylene oxide by I. G. Farben. (BIOS Final Rept 360, Item 22) Nov 1945. 9 p. Price: Microfilm-$1.00-Photostat-$1.00

This report summarises briefly the manufacture of ethylene oxide and glycols by I. G. Farbenindustrie. In addition the development of a direct air-oxidation process for ethylene oxide is discussed. Appended is a flow sheet of an air-oxidation pilot plant.

PB 25709. HAUPT. Paraffining (impregnation) of sinter rings. Refers to absorption figures and acceleration of oxidation of paraffin by sinter iron as catalyst. (BIOS Halstead Exploiting Centre Rept 5519) Aug 1941. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00

This report concerns tests to determine the effect of "sintered" iron on paraffin. It was concluded that: (1) Paraffin heated to 120° C. oxidises in the presence of atmospheric oxygen; (2) in the presence of sintered iron, the oxidation is lower, but considerable quantities of iron are dissolved; (3) to prevent this oxidation, the paraffin bath must be airtight, or a suitable additional compound for the paraffin bath must be found which prevents oxidation; (4) as the oxidation depends on the time in the presence of atmospheric oxygen, a procedure has been proposed which is distinguished by charging the bands in the vacuum so that, in this procedure, the time factor is replaced by the vacuum factor expressed in mm. of mercury. Test data and graphs of the oxidation of paraffin at 120° C. are included. This document is a translation of "FMP-Report No. 3" of the Deutsche Waffen- und Munitions-Fabriken, A. G.

PB 27009. LOTZ. Translation of German document on infra-red sensitive phosphors. (JIOA Rept 7) Aug 1945. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00

This document contains both the translation and the original manuscript of a report on the experimental work done on phosphors in the research laboratories of Siemens-Werke. The ingredients used in manufacture are given together with procedure, comparison of types, chemical properties and uses. There is also a critique recommending further developmental work. The two types compared are a Europium-Samarium phosphor and a Cerium-Samarium phosphor.

PB 25587. MORLEY, R. J. Winkler generators for manufacture of water gas, etc. (BIOS Final Rept 333, Item 30) 1945. 49 p. Price: Microfilm-$1.00 - Photostat-$4.00

All the available information concerning Winkler generators contained in C.I.O.S. reports and in documents brought back by C.I.O.S. missions to Germany in 1945 is collected and combined with literature references to give a comprehensive account of the history and present status of the process. There are at least five large plants in Central Germany and Czechoslovakia using the process and possibly one plant in Japan. The process is technically sound and well established but appears to be economic only where cheap fuel, e.g. brown coal or brown coal coke, is available, which cannot be gasified conveniently in other ways. The first large scale Winkler generator for making power gas was put into operation at Leuna in 1926 and the first large scale generator making water gas followed in 1930; the successful use of a "boiling" bed of fine fuel thus introduced a new process for the manufacture of power gas and water gas. Since then the process has become firmly established inside Germany and since 1936 has found considerable use in the large scale production of hydrogen in plants manufacturing gasolines, oils, etc., by the hydrogenation of brown coal and brown coal tar. For the manufacture of hydrogen the process requires large quantities of oxygen, and despite the fact that the Linde-Frānkl process, developed in the last 20 years, is a marked improvement over older processes, oxygen is still relatively expensive, so that its use, and hence the use of the Winkler process, can only be justified when it makes possible the use of a cheap fuel, which otherwise could not be satisfactorily gasified. This explains why all known Winkler generators are located near the brown coal fields of Central Europe; brown coal, as obtained by open strip mining, is very cheap, but it is difficult to get into a form suitable for use in a conventional "make-and-blow" water-gas generator; on the other hand brown coal is an ideal fuel for a Winkler generator. In recent years German economy has been such that it was advantageous to produce vast quantities of gasoline and oil from indigenous coal. A particularly favorable process was to hydrogenate the tar obtained from the low temperature carbonisation of brown coal briquettes; this carbonization produced several times as much brown coal coke, or "grude" coke, as it did tar, so that a use had to be found for the vast quantities of grude. The biggest use of grude was for firing the boilers of power stations, already existing in many cases and previously using raw brown coal, but it was also very convenient to use grude for making the hydrogen, required for hydrogenating the tar. Moreover since the Winkler process resulted in an appreciable fraction of the fuel being carried over as dust with the gas, it was also very convenient to be able to recover this dust and use it as boiler fuel. Thus there grew up in Central Germany, centered around Leipzig, a collection of large factories, all primarily based on the vast deposits of brown coal found in that region; these factories, although carrying on different processes, are largely inter-related and are often located on the same or neighboring sites. The Winkler process is not suited to making industrial gas as the calorific value is low, and its field of application appears to be limited to the large scale production of (a) water gas, to be used for the manufacture of hydrogen, methanol or Fischer-Tropsch synthesis gas, (b) producer gas, to be used as a fuel gas or power gas, and (c) ammonia synthesis gas, but in all cases based on a cheap fuel, not otherwise easily utilisable. This document is illustrated with photographs of equipment together with schematic flow sheets, graphs, tables and bibliography.

PB 25680. MURRAY, C. A. Azalia benzole refinery, Harpener Bergwerksverein, Bochum. (BIOS Final Rept 331, Item 30) Oct 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report is a description of a benzene refinery. Crude benzene received from coke-oven plants is refined to chemically pure benzene. Of considerable interest was a still which was set up for continuous rectification.

PB 19419. OPPEN, DR. Zweiter forschungsbericht: Gesellschaft fur teerverwertung m.b.H., Duisberg-Meidericht (Second research report: Association for the utilization of tar Duisberg-Meidericht) (Reichsforschungsrat) (ALSOS Mission, RFR 507 8). Dec 1944. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This document is a brief report of research work at this institution. The studies dealt with are: (1) Preparation of pure phenanthrene, free of anthracene, without the use of chromic acid; (2) Desulfurizing of phenanthrene; (3) Isolation of 1, 2- benzanthracene from the chrysene fraction of coal tar, with simultaneous isolation of the base-containing components; and (4) Search for the α homolog of β-methyl anthracene. In German.

PB 23747. ROBERTS, F. H. Synthesis of acetone. (CIOS File XXX-2, Item 22) Jun 1945. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
The information in this report was obtained during an interrogation of Dr. Sachsse of I. G. Farbenindustrie Plant at Ludwigshafen, 28 May 1945. The production of acetone at Ludwigshafen was 400 tons per month and the chemistry involved is a novel process. Raw materials are acetylene and water. These are passed in vapor phase over a catalyst of pure zinc oxide. Yields and efficiencies to acetone of 80 to 90 percent of the theoretical are claimed for the process. By products of higher ketones and acetaldehyde are formed, which, if recovered, would raise the efficiency of the consumed acetylene. The method of operation does not attempt recovery of by-products.

PB 27124. ROSE, J. D. Propargyl alcohol; dehydration and oxidation to hexadiinediol. Interview with Dr. von Kitepov, Exupt laboratorium, I. G. Farben, Ludwigshafen. (BIOS Final Rept 357 Item 22) Nov 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
Aqueous propargyl alcohol recovered from the butinediol plant can be dehydrated by azeotropic distillation with 2:5 dimethyltetrahydrofuran. Experiments also in progress at Ludwigshafen indicated that benzene could be used in place of dimethyltetrahydrofuran. Air oxidation of propargyl alcohol in the presence of ammonium chloride-cuprous chloride catalysts gives excellent yields of hexadiinediol. Flow sheets for the dehydration process and the subsequent oxidation process are given.

PB 15002. SPITZER, FRIEDRICH. Die bestimmung der piezoelektrischen moduln einiger isomorpher kristalle. (The determination of the piezoelectric moduli of several isomorphic crystals). Dissertation, Univ. of Göttingen. (Supplementary material to PB-14620: Notes on interviews with German scientists on synthetic crystals in August and September, 1945). 1938. 31 p. Price: Microfilm-50¢ - Photostat-$3.00
This film reproduces the thesis of the author wherein he gives the mechanics and mathematics of the determination of the piezoelectric moduli. Drawings of apparatus and schematic diagram are included.

PB 23376. U. S. STRATEGIC BOMBING SURVEY. Ludwigshafen-Oppau Works, Ludwigshafen a.R., Germany: I.G. Farbenindustrie A.G. (Rept 117; Plant Rept 3). Aug 1945. 667 p. Price: Microfilm-$7.00 - Photostat-$45.00
This is a report of aerial attacks on the largest chemical plant in Germany. This 1,183-acre plant turned out more than 2,000 products, including more than a third of Germany's supply of fixed nitrogen for fertilizer and explosives. The plant employed about 40,000 persons. Personnel records found show that about 20 nationalities were represented among the displaced persons working in the plant. The industrial area was bombed 121 times, and the plant was hit on 56 occasions. In those attacks 1,746 tons of high explosive and incendiary bombs fell within the works. An average of 1.38 tons of high explosive bombs per acre exploded in the plant, and the average weight of the high explosive dropped was 720 pounds. The strategic bombing of this plant began July 30, 1944 and continued until March 1945, bombs hitting the plant 26 times during the period. The appendix to this report contains three sets of documents: (1) a very detailed report of the organization and functioning of the ARP or passive defense activities at Ludwigshafen-Oppau; (2) correspondence between Dr. Mueller-Cunradi, manager at Oppau, and the plant manager at Leuna, Dr. Schneider, on the effects of strategic bombing on the Oppau plant; and (3) the reports of the Ludwigshafen-Oppau ARP chief, Fritz Mueller, on each attack from Sep 6, 1943 through the attack of Oct 29, 1944. Fragments from Fritz Mueller's files have been assembled as far as possible from that date to the date of the attack on Mar 1, 1945. These attack reports give: (1) the reports of the progress of the attack from the warning service, the tower deservers and other sources; (2) an overall review of the attack; (3) a summary of the effects in numbers of bombs, amount of damage, number of casualties, the effect on production, etc.; (4) the same information for each of the 30 or more sectors; (5) the disposition of ARP forces and military reinforcements, the activities of special technical repair groups, and the conclusions of the ARP chief. It is believed that these documents are unique and that they will provide valuable first-hand information. Photographs, maps, tables, graphs, and diagrams are included.

Japanese

PB 18627. U. S. CHEMICAL WARFARE SERVICE. Summary of research activity conducted by the Chemistry and Physics Departments of Osaka University during 1941-1945. Jan 1946. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
This information was furnished to one of the Chemical Warfare Service intelligence team officers. The following topics are discussed: (1) Stabilization of nitromannit (mannitol nitrate); (2) dehydration-isomerization of n-butanol (butyl alcohol) and isomerization of n-butene; (3) search for a substitute for quartz or Rochelle salt (potassium sodium tartrate) as piezo-electric material; (4) polymerization of butenes with acid clays; (5) investigation on the peculiarity of alcohols as motor fuel; (6) spectrochemical (spectroscopic) analysis; (7) polyethylene; and (8) powder metallurgy.

United States

PB 18863. BACHMANN, WERNER E. The oxynitration of benzene to 2, 4-dinitrophenol. (OSRD Rept 4026) Feb 1945. 25 p. Price: Microfilm-50¢ - Photostat-$2.00
This report concerns the direct oxynitration to either 2,4-dinitrophenol or picric acid, a process which would obviate the necessity of conversion to phenol or chlorobenzene. Consideration of the reaction mechanism led to the conclusion that improved yields of picric acid could be obtained by a two-stage process involving oxynitration to 2,4-dinitrophenol and subsequent conversion to picric acid by the conventional nitration methods. This conclusion was fully confirmed by laboratory trials. A process was devised whereby oxynitration of benzene to dinitrophenol was accomplished in 82% yields, and dinitrophenol was converted to picric acid in 96% yields. The two-stage process gives an overall yield of 78-79% for the conversion of benzene to picric acid, compared with a 50% yield by the one-stage oxynitration to picric acid. Reports dealing with the mechanism and kinetics of the oxynitration have already appeared as OSRD 3154 and 4024. This is a progress report under contract with the University of Michigan.

PB 22291. BERNSTEIN, CHARLES H. Removing the meniscus. n. d. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
A method is given whereby clean and dry glassware is subjected to an atmosphere of 50% relative humidity for a few minutes and then to the vapors of methylchlorosilane in the form of General Electric Dri-Film 9977. A silicone is formed and hydrochloric acid split out. References are given. The author is from the Chemical Laboratory, Naval Powder Factory, Indian Head, Md.

PB 20765. BETTS, W. V. Preparation of chlorvinyldifluorarsine. (Edgewood Arsenal Chemical Div Rept 141) Apr 1922. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Chlorvinyldifluorarsine is not known, but as it is related to the strongly vesicant chlorvinyldichlorarsine, its preparation was made the object of this experiment. Trichlorvinylarsine reacts with arsenic trichloride to form chlorvinyldichlorarsine. If arsenic trifluoride reacts in the same manner, chlorvinyldifluorarsine should be formed when trichlorvinylarsine is heated with arsenic trifluoride. No chlorvinyldifluorarsine was formed when arsenic trifluoride and trichlorvinylarsine were heated together at 150°C. in a lead-lined iron autoclave. The procedure followed is described.

PB 26943. BOUDER, M. M. Fundamental study of toxicity. The stability of certain organic arsenicals in acetone and alcohol (and memorandum. Methods for determining the purity of a trivalent organic arsenical difficulty soluble in water, Aug 30, 1934) (Edgewood Arsenal Chemical Div Rept 454) May 1928. 27 p. Price: Microfilm-$1.00 - Photostat-$2.00
The stability of a number of organic arsenicals in solution in acetone and alcohol was determined. The compounds studied were diphenylaminechlorarsine (DM), diphenylaminearsenious oxide (DM oxide) diphenylchlorarsine (DA), diphenylarsenius oxide (DA oxide), methylarsenious oxide, and diphenylcyanarsine (Cyan DA). Experiments in acetone were conducted with DM, DA and their oxides, and methylarsenious oxide. Excessive oxidation occurs in all cases under ordinary laboratory conditions even though the acetone is purified by distillation over potassium hydroxide. Experiments in 95% alcohol were conducted with DM, DA, Cyan DA, and methylarsenious oxide. Solutions are generally stable if kept in the dark. 95% alcohol is thus the best solvent for arsenicals insofar as stability is concerned. Methods for determining the purity of trivalent organic arsenicals difficulty soluble in water were further investigated by the author. The purity of a trivalent organic arsenical should properly be based upon its trivalent organic arsenic content. Two methods for determining the latter are recommended. A method for determining the total trivalent arsenic content (organic plus inorganic) is also recommended. These methods involve titration with N/200 iodine solution (1 cc. equivalent to 0.1873 mg. of arsenic) containing 1.25 g. of KI/l.

PB 25806. BOUDER, M. M. Stability of methyl arsenious oxide indilute aqueous solutions, bound,with memorandum, Analysis of a water solution of a trivalent organic arsenical, dated Aug 30, 1934. (Edgewood Arsenal Chemical Div Rept 373) Mar 1928. 47 p. Price: Microfilm-$1.00 - Photostat-$4.00
This investigation was conducted in an attempt to determine the chemical reactions involved when methyl arsenious oxide, CH_3AsO, is dissolved in ordinary distilled water; to determine analysis with a number of oxidising agents; and to show the bearing of these data on the toxicity of the compound. Dilute aqueous solutions of CH_3AsO were allowed to age at room temperature in glass stoppered flasks standing in diffused light in an atmosphere containing oxygen. Samples of the solution were analyzed at intervals. It was found that two slow simultaneous reactions of CH_3AsO with water and dissolved oxygen occurred, forming methyl arsonic acid on the one hand and methyl alcohol and inorganic trivalent arsenic on the other. The rate of the first reaction is 1.35 times that of the second. Tables of test data and bibliography are included.

PB 26944. BOUDER, M. M. and KIBLER, A. L. Fundamental study of toxicity. Research on the solubility relations of toxic smokes towards olive oil and water. (Edgewood Arsenal Chemical Div Rept 455). May 1928. 36 p. Price: Microfilm-$1.00 - Photostat-$3.00
It was assumed that the action of toxic smokes is connected with its solubility relations towards the lipoid nerve endings and the watery fluid found in mucous membranes. Attempts were made to determine the solubility of several typical toxic smokes in olive oil and in water, and their partition coefficients between these two solvents. A special technique was also devised using an ultramicroscope set-up, whereby smoke particles could be observed as they fell on films of olive oil and water stretched on wire loops in the ultramicroscope cell. It was found that arsenical toxic smokes are unstable both in olive oil and water. Therefore, no true solubilities nor partition coefficients could be determined. It was learned, however, that the more irritating arsenical toxic smokes are only very slightly soluble in water and quite appreciably soluble in olive oil. The partition coefficient is, therefore, comparatively high. Also, for arsenicals of somewhat similar chemical constitution but with low irritating powers, the solubility in olive oil and in water are both high and the partition coefficients are low. It was also found that when toxic smoke particles are generated in moist air they are insoluble in olive oil and in water. When generated in dry air they are soluble in olive oil and insoluble in water. When chemically related compounds of low irritating power are tested their solubility relations are much less definite but the tendency is towards greater solubility in both solvents. The solubility of moist toxic smoke particles in olive oil is due to a moisture film around the particles. When the olive oil and the water contain an emulsifying agent (sodium oleate) the solubility of the particles is increased. A blueprint of an atomizer is included.

PB 26945 and PB 26946. DANNER, C. E. and others. Fundamental study of toxicity. Miscellaneous data. (Edgewood Arsenal Chemical Div Rept 456 and 456 supplement No. 1) May 1928, Mar 1932. PB 26945 (Rept 456), 49 p. Price: Microfilm-$1.00 - Photostat-$4.00. PB 26946. (Rept 456 Sup. 1), 13 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report contains descriptions of several pieces of experimental work which were done in connection with the Fundamental Study of Toxicity. It is collected in one report because it is of a miscellaneous nature and it is not considered necessary to employ for each subject the usual form assigned to Edgewood Arsenal Chemical Division Reports. This report, therefore, consists of separate sections, each section complete in itself and containing the divisions considered applicable to that section, together with appropriate conclusions. The subjects of the sections are as follows: Fat and water in tadpoles. Oxygen absorbed by tadpoles. Preliminary tests of certain toxic smokes. Solvents for arsenicals. Absorption of ethyliodoacetate by tadpoles. Application of Henry's law to the solubility of vapors in olive oil. Determination of the effect of hydrochloric acid on the narcotic power of chloroform on tadpoles. The supplement contains additional data on the determination of fat and water in tadpoles and absorption of ethyliodoacetate by tadpoles. Toxicity tests. Work reported in the supplement was done by Danner, C. E. and Knight, H. C.

PB 18870. ELDERFIELD, R. C. and HAMMETT, L. P. Kinetic studies on the nitration process: Progress report, Sep 30, 1942. (OSRD Rept 1154) Jan 1943. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
A number of methods have been investigated for the determination of the extent of the nitration reaction on samples of reaction material so small that high concentration perchloric acid might safely be used as the reaction medium. One of these, a micro-Kjeldahl analysis, gave satisfactory results on known solutions which duplicated the reaction mixture. For unknown reasons, actual kinetic measurements, had, however, a low degree of reproducibility. This is a final report under contract with Columbia University.

PB 18869. ELDERFIELD, R. C. The nitration of benzene and toluene in the absence of sulfuric acid according to a process submitted by the Autoxygen Company: Final report. (OSRD Rept 1192) Feb 1943. 14 p. Price: Microfilm - 50¢ - Photostat - $1.00
This report describes laboratory experiments on the nitration of aromatic compounds by a process disclosed to the Ordnance Department and to NDRC by Dr. Kokatnur of the Autoxygen Company. This process does not require mixed acid and uses azeotropic distillation for dehydration of the reaction mixture. The nitration of benzene, toluene, and mononitrotoluene in the absence of sulfuric acid, in a system whereby the water present or formed is removed by azeotropic distillation with a suitable solvent was investigated. Very small yields of dinitrotoluene were obtained in a few runs. In others, the nitration did not proceed beyond the mononitro stage, and even this in only fair yield. With benzene, better success attended the nitration to nitrobenzene, particularly when excess benzene was used to remove the water. Considerable amounts of nitric acid are carried over with the water, so that acid recovery is not eliminated. This process does not appear to be suitable for the formation of di- and trinitro derivatives. The reaction is slow and would require relatively large scale equipment.

PB 20706. EVANS, S. M. Preparation of pyromucyl chloride. (Edgewood Arsenal Chemical Div Rept 159) May 1922. 11 p. Price: Microfilm - 50¢ - Photostat - $1.00
Furfural was prepared by distilling bran with sulphuric acid. A yield of 2.4% by weight, based on the bran used, was obtained. The yield claimed by the method is 2.5-3.5%. Pyromucic acid was prepared by oxidizing furfural with an alkaline solution of potassium permanganate. The yield obtained was 41.2% of theory, based on furfural. Pyromucyl chloride was obtained by heating pyromucic acid with thionyl chloride and purifying the product by distillation. Yields of 64.5% of theory, based on pyromucic acid, were obtained. Toxicity tests on this material gave the lethal point as 4.4 mg./l., irritation at .12 mg./l. and lachrymation at .99 mg./l. All tests were run on mice for a 10 minute exposure. History, properties, description of materials and procedures, bibliography and drawing of apparatus are included.

PB 20587. FABER, E. M. and HALL, W. E. Laboratory preparation of chloroacetic acid. (Edgewood Arsenal Chemical Div Rept 82). Nov 1921. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
This investigation of preparation of monochloroacetic acid by chlorinating glacial acetic acid by the phosphorus method was undertaken for the purpose of attempting (1) to obtain better yields than were previously secured and (2) to decrease the amount of red phosphorus used without lowering the yield or increasing the time necessary for chlorination. The report describes the preparation, properties, testing and analysis, and apparatus. Yields of about 85% of theory were obtained. It was concluded that 4% of red phosphorus was in excess of actual requirement for chlorination and that greater yields would be obtained if a more efficient type of condenser were used. Diagrams of apparatus.

PB 20645. FABER, E. M. Preparation of diethyl selenide. (Edgewood Arsenal Chemical Div Rept 277). Apr 1923. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
The preparation of this compound was undertaken in order to test it as a camouflage for various war gases. Its preparation according to the method of Von Pieverling did not give satisfactory results. The yield of diethyl selenide was low and the intermediate, potassium ethyl sulphate, could not be prepared efficiently. A good quality of diethyl selenide was obtained by a method secured from the General Motors Research Corporation. In this method sodium selenide and diethyl sulfate are allowed to react. Experimental data and properties are given.

PB 25578. FABER, E. M. Preparation of monomercaptoethyl sulfide. (Edgewood Arsenal Chemical Div Rept 496) Dec 1928. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
The procedure employed in this preparation consisted of the following steps: (1) Preparation of ethyl mercaptan by distilling a mixture of the concentrated solutions of sodium ethylsulfate and potassium hydrosulfide; (2) Preparation of monohydroxyethyl sulfide by the interaction of ethyl mercaptan and ethylene chlorohydrin; (3) Preparation of monochloroethyl sulfide by the action of phosphorus trichloride on the hydroxy compound; (4) Preparation of monomercaptoethyl sulfide by heating the monochloro derivative with potassium hydrosulfide. Thirty-three grams of monomercaptoethyl sulfide was prepared for the Medical Research Division for testing as an antidote for arsenic poisoning.

PB 23692. FRAZER, J. C. W. and HORN, F. HUBBARD. Interaction of carbon monoxide and iron, Progress report. (NDRC Rept A-92; OSRD Rept 873). Sep 1942. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
A survey has been made of the literature dealing with the formation of iron carbonyl by the reaction of carbon monoxide with iron and steels of various compositions. This effect may have a bearing on the erosion of guns. The report deals with the equilibrium between iron, gaseous carbon monoxide and iron pentacarbonyl vapor, the action of carbon monoxide on steels, the solubility of carbon monoxide in iron and steel, and the decomposition of carbon monoxide. Graph of percentage by volume of iron pentacarbonyl vapor versus temperature and pressure and bibliography are included. This is a progress report under contract with Johns Hopkins University.

PB 22027. HARRIS, B. L. and MACY, R. Hygroscopicity of hexamine. (CWS Tech Div Memo Rept 1006) Mar 1945. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
The object of the investigation was to ascertain whether hexamine, which is the specification stabilizer for Levinstein H, (mustard gas) should be stored in airtight containers. The vapor pressure of saturated hexamine solutions in water was measured at various temperatures and results are tabulated. The solubility of hexamine in water was measured and compared with published figures. Under normal temperature conditions hexamine does not absorb moisture from the air if the relative humidity is below about 70%. In tropical or wet summer conditions, hexamine should be stored in airtight containers. Historical, theoretical, and experimental data are given in the report. Conclusions, recommendations and bibliography and graph are attached.

PB 26952. HARTWETT, J. G. Nonleaching impregnants for marine piling protection. Supplement 1. (Edgewood Arsenal Chemical Div Rept 494, Supp 1) Aug 1933. 17 p. Price: Microfilm-$1.00 - Photostat-$2.00
The object of the work was to prevent marine borer attack on new wooden structures in sea water, particularly by the addition of a toxic held in the wood by an impregnant which would not leach out by the action of sea water. Vehicles were prepared which were semi-solid at 45° C. by the addition of Montan wax, naphthalene, and anthracene to liquid vehicles, particularly creosote and fuel oil. This supplement presents data secured on the last two inspections of these test pieces, installed in 1928 and 1929. The results of the inspections are given in detail in tables. Photographs are included.

PB 20586. HENLEY, F.M. Comparison of the plain and impregnated felt filters against toxic smokes. (Edgewood Arsenal Chemical Div Rept 81) Oct 1921. 13 p. Price: Microfilm - 50¢ - Photostat - $1.00
The efficiency of impregnated and unimpregnated felt gas mask filters against D M (Adamsite) smoke was tested. The impregnation material was lampblack and the methods of impregnation are given. It was found that the impregnated felt offered better protection against toxic smokes than other filters theretofore developed.

PB 25503. HENLEY, F. M. Report on the preparation of monochloroacetic acid by the chlorination of acetic acid in the presence of red phosphorus. (Edgewood Arsenal Chemical Div Rept 2) Mar 1920. 9 p. Price: Mitrofilm-$1.00 - Photostat-$1.00
Through the use of red phosphorus as a catalyst, the product may be prepared more easily, more efficiently, and more safely, giving, at the same time, a better product than that yielded in the use of sulfur monochloride as a carrier. A comparison of the two methods is given. Yields of at least 75%, based on the theoretical amount, have been consistently obtained. For later report, see Chemical Division Rept 7 (PB 25505).

PB 20619. HENLEY, F.M. and ASHLEY, K. D. The manufacture of chloracetic acid; the condition of the phosphorus at the end of the reaction. (Edgewood Arsenal Chemical Div Rept 27) Oct 1920. 5 p. Price: Microfilm - 50¢ - Photostat - $1.00
Monochloracetic acid is made by the chlorination of acetic acid at 100°C. in the presence of red phosphorus, which not only acts as the chlorine carrier, but undergoes chemical change in the reaction. The purpose of this investigation was to determine as nearly as possible the condition of the phosphorus at the completion of the reaction. In nearly every case conclusive tests showed the presence of phosphoric acid proving that the phosphorus is in the form of the oxychloride. The mechanism for the reactions involved is discussed, and equations for the reactions presented.

PB 20622. HENLEY, F. M. and FREUND, G. L. The attempts to regenerate aluminum chloride from the Friedel-Crafts reaction in the preparation of chloroacetophenone. (Edgewood Arsenal Chemical Div Rept 15). Jun 1920. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
It was ascertained that the aluminum chloride did not remain in the free state at the end of the reaction. Tests disclosed that it existed in the form of a complex, which could not be broken up without breaking up the aluminum chloride. Further tests showed that the aluminum chloride could not be removed from the complex by distillation or treatment with hydrogen chloride, nor can it be separated in the form of $AlCl_3.XH_2O$ and then dehydrated by heating with an anhydrous salt.

PB 25516. HENLEY, F. M. and LONG, W. T. The manufacture of chloroacetic acid, a control method for determining the speed of the reaction. (Edgewood Arsenal Chemical Div Rept 24) Oct 1920. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
The method depends upon the partial fractionation of the chloroacetic acid by distillation. Under the same conditions of distillation a definite percentage of chloroacetic acid from a given mixture will distill over between 175-195° C. A table is attached showing the actual conversion for every percent apparent conversion.

PB 25505. HENLEY, F. M. and O'LEARY, J. J. Report on effect of chlorinating acetic acid with previously used red phosphorus and methods of varying the process. (Edgewood Arsenal Chemical Div Rept 7). May 1920. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
It is shown that phosphorus which has been used for a previous chlorination, and separated by allowing to settle and drawing off, contains 56⅓% monochloroacetic acid. Tests are related which show that 4% actual phosphorus must be necessary for a successful chlorination. It is proven that the condition of the phosphorus as it comes from a previous chlorination is of small matter, but that it is essential to determine the amount of actual phosphorus in order to maintain the necessary 4% for chlorination. For earlier report, see Chemical Division Rept 2 (PB 25503).

PB 23201. HOUGEN, O. A. and DODGE, F. W. Drying of gases: Final report, Jun 30, 1941. (OSRD Rept 122) Aug 1941. 152 p. Price: Microfilm-$2.00 - Photostat-$11.00
This report represents a collection of technical information basic to the design of equipment for the drying of gases. Various desiccants are compared and the methods of use of each are indicated. Although installations for specific purposes are not presented, the attempt has been made to summarize the necessary technical information on the basis of which designs for specific purposes may be based. This work was done under contract with the University of Wisconsin. The information contained in this report suggests applications in the conditioning of air for a large variety of purposes especially for industrial uses. The report is profusely illustrated with graphs, tables, drawings and photographs. Pertinent literature to which reference is made comprises a bibliography.

PB 22871. JESSUP, RALPH S. and PROSEN, EDWARD J. Heats of combustion of celluloses and nitrocelluloses. (NDRC Armor and Ordnance Rept A-285; OSRD Rept 3932) Jul 1944. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
Results obtained in an investigation by the National Bureau of Standards to determine the heats of combustion of two lots of cellulose, four lots of nitrocellulose from wood pulp, and four lots of nitrocellulose from cotton linters are given in this report. Included are descriptions of the materials and calorimetric experiments. Apparatus is described and procedures of experiment are given in detail. The results are given in tabulated form and a short bibliography is included.

PB 25561. LAIRD, A. W. and SCOTT, C. M. Mustard oil plant report, and Memorandum of notes concerning the mustard gas plant at Edgewood Arsenal, as communicated by Dr. Herbert Levenstein, dated Sep 2, 1925. (Edgewood Arsenal Chemical Div Rept 201) Jul 1921. 91 p. Price: Microfilm-$2.00 - Photostat-$7.00
The mustard oil plant comprises three distinct units: the ethylene plant, the sulfur chloride plant and the mustard oil plant proper. The ethylene and sulfur chloride plants are described in separate reports by Scott and Laird, July 1, 1921 (PB 25563). This report covers the mustard oil plant proper and the ethylene drying and compression process. Mustard gas is dichlorodiethyl sulfide and is produced by the Levenstein process which is based upon the reaction of sulfur monochloride with ethylene at 30 to 38° C. This reaction is accompanied by the evolution of considerable heat. In the notes concerning the visit of Dr. Levenstein to Edgewood Arsenal, suggestions are made to improve the production and purity of the product. Schematic flow charts, drawings of equipment, and graphs included.

PB 20691. MILLER, G. E. Laboratory development of the manufacture of picric acid. (Edgewood Arsenal Chemical Div Rept 238). Jan 1923. 72 p. Price: Microfilm-$1.00 - Photostat-$5.00
This report describes the development of a new process for the preparation of dinitrophenol which can then be converted into picric acid. Data covered by the report are: (1) theory; (2) methods of testing and analysis; (3) experimental; (a) small scale static runs, (b) large scale runs, and (c) nitration of dinitrophenol to picric acid; (4) cost data; and (5) bibliography. Tables, diagrams and graphs are included.

PB 19684. MILLER, R. R. and others. Experimental control of CO_2 and oxygen concentrations aboard the USS Sailfish: Eighteenth partial report on oxygen source materials. (Naval Research Lab Rept P-2665) Oct 1945. 38 p. Price: Microfilm - 50¢ - Photostat - $3.00
The atmosphere in the submarine was controlled within rather narrow limits at 3% carbon dioxide and 17% oxygen. The total submerged period lasted for 68 hours of which 14 were required to reach the desired concentrations. For 24 hours the atmosphere was controlled by the chlorate candle-lithium hydroxide system, for the second 24 hours KOX (potassium tetroxide) canisters were used and the final 6 hours used up excess materials and allowed a further shift of the concentrations. The purification systems used

showed excellent results at the 3% CO_2 concentration, with two canisters of pelleted lithium hydroxide running simultaneously removing the CO_2 exhaled by 90 men. Three canisters of KOX (potassium tetroxide) running simultaneously removed the CO_2 and furnished oxygen under similar conditions. One chlorate candle was used each 55 minutes and furnished oxygen at the rate of 1 cu.ft./minute during the time lithium hydroxide was used for CO_2 absorbent. Photographs of blower and canister, tables, blueprints, graphs, and bibliography are appended.

PB 23764. NATIONAL RESEARCH CORPORATION. Rain-repellent coatings as an aid to visibility through vision devices. (OSRD Rept 960) n. d. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
A promising method of eliminating the deleterious effects of rain on glass and transparent plastic surfaces, aside from the use of mechanical windshields, has been the use of rain-repellent coatings. These coatings possess very poor wettability by water, i. e., the angle of contact between the solid, water and air is large, being in excess of 90° as measured through the water phase. Lorr Rain Repeller, a product available commercially, and two materials developed as a result of the present research, Anti-Rain Compound-Experimental Type 2-A which is compounded as a paste and Anti-Rain Experimental Type 2-B which is compounded as a stick, are discussed from the viewpoint of their ease of application to glass and plastic surfaces, their degree of water repellency, and durability under rainconditions. Photographs showing the contact angle of these repellents on glass, views of a model airplane through dry glass, through glass coated with Compound Type 2-A during rain of .22 inches of rain per hour and through uncoated glass under the same conditions of rain. The results of durability tests on anti-rain compounds is also illustrated.

PB 25515. PRALATOWSKI, F. M. and MELTZ, N. B. A preliminary report on the preparation of benzyl cyanide. (Edgewood Arsenal Chemical Div Rept 19) Jul 1920. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
Results are given for preparation of benzyl cyanide which in turn is to be used for preparation of bromobenzyl cyanide. The materials used are alcohol, water, sodium cyanide, benzyl chloride and benzene.

PB 22746. PRESCOTT, D. P. and KOEN, ELIZABETH B. Improved impregnating methods for clothing. Thermal decomposition and corrosive action of calcium carbonate ATC impregnating solution. (CWS Tech Div Memo Rept 775) Nov 1943. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
The object of the work described in this report was to determine the decomposition and decomposition temperature of a calcium carbonate acetylene tetrachloride impregnating solution using comparable equipment and methods to those previously used in testing zinc oxide solution. Corrosion data on aluminum was also desired. It was thought that the substitution of $CaCO_3$ for ZnO in the solution would decrease the decomposition of the solution and corrosion of the aluminum equipment. Detailed descriptions of the tests made to determine effect of this change are given and the results are tabulated. It was concluded that: (1) At 85°C. the presence of water slightly retards the decomposition of the calcium carbonate impregnating solution; (2) the corrosion rate of aluminum is greatly accelerated by the presence of water in calcium carbonate impregnating solution, but this corrosion is less than with zinc oxide impregnating solution either in the presence or absence of water; and (3) on heating the impregnating solution with constant current no exothermic nor violent reaction occurs in the presence of $CaCO_3$ with or without aluminum metal, as is the case when zinc oxide is present in the impregnating solution. Photographs showing corrosion in aluminum specimens.

PB 20598. RANKIN, G. A. Ethylene, production and sources. (Edgewood Arsenal Chemical Div Rept 95). Sep 1921. 29 p. Price: Microfilm-50¢ - Photostat-$2.00
Conclusions are that the most likely sources are: (1) ethyl alcohol, (2) cracking of methane (natural gas), (3) oil refineries and by-product coke ovens, (4) hydrogenation of acetylene and (5) reduction of carbon monoxide.

PB 20629. REED, A. B. Preparation of 2:4 - dinitrophenyl β chlorethyl sulphide, 2:4 - dinitrophenyl β chlorethyl sulphoxide, and 2:4 - dinitrophenyl β chlorethyl sulphone. (Edgewood Arsenal Chemical Div Rept 251) Feb 1923. 10 p. Price: Microfilm - 50¢ - Photostat - $1.00
The sulphide and sulphoxide were prepared according to the method described by Bennet and Whincop. (J. Chem. Soc., 119, 1860, 1921). The sulphide was prepared by condensing monothio ethylene glycol with 2,4 dinitro chlorobenzene and treating the hydroxy compound thus formed with phosphorus pentachloride. The sulphoxide was obtained by oxidizing the sulphide with fuming nitric acid. The sulphone was prepared by oxidizing the sulphoxide with chromic acid solution. None of the three was vesicant to man in a saturated solution in absolute ethyl alcohol.

PB 25356. REEVES, A. M. Attempted preparation of trichlornitroethylene $Cl_2C{:}CCl(NO_2)$. (Edgewood Arsenal Chemical Div Rept 439) Nov 1927. 7 p. Price: Microfilm - $1.00 - Photostat - $1.00
The preparation was attempted by the addition of tetrachlorethylene to a mixture of fuming nitric acid and concentrated sulfuric acid. The only reaction products isolated were small quantities of dinitrotetrachlorethane and trichloracetyl chloride. The latter material is an oxidation product of tetrachlorethylene. The desired material was not obtained.

PB 25816. REEVES, A. M. An attempt to prepare bis beta chlorvinyl thiocyanoarsine. (Edgewood Arsenal Chemical Div Rept 390) Sep 1926. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
The report describes attempts to produce the chemical named, in order to test its toxicity. The preparation was attempted in an alcohol-water medium and the resulting product was apparently hydrolyzed to the corresponding oxide. In a non-aqueous medium, as acetone, the principal product was a solid which was apparently a polymeric form of the desired compound. Tables of test data are included.

PB 20727. REEVES, A. M. Preparation of chlormethylethinyl ketone. (Edgewood Arsenal Chemical Div Rept 186) Jun 1922. 7 p. Price: Microfilm - 50¢ - Photostat - $1.00
Attempts were made to prepare chlormethylethinyl ketone, $HC{\equiv}COOCH_2Cl$. No reaction took place between acetylide and chloracetylchloride under the conditions described. Failure to react in solution may be due to the insolubility of sodium acetylide in the solvents employed. Results of experiments with sodium heptylide were not considered to be sufficiently promising to warrant further work.

PB 20743. ROWE, A. M. Plant development and manufacture of cyanogen bromide. (Edgewood Arsenal Chemical Div Rept 114) Mar 1922. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
Since the use of cyanogen bromide as a rodent exterminator appeared promising from small-scale experiments, the production of this compound on a semi-works basis was undertaken. Cyanogen bromide was manufactured by the action of sulphuric acid on solutions of sodium cyanide and mining salts (a mixture of sodium bromide and sodium bromate). The methods and equipment used are described and diagrams of the equipment are included.

PB 20709. SCHUTON, H. A. Preparation of para-dimethylaminobenzaldehyde. (Edgewood Arsenal Chemical Div Rept 163) May 1922. 5 p. Price: Microfilm - 50¢ - Photostat - $1.00
Para-dimethylaminobenzaldehyde was prepared for use as an indicator for phosgene. Dimethylaniline was treated with formaldehyde in the presence of hydrochloric acid. The highest yield of final product was 75% of theory. The experimental runs are recorded in the report.

ELECTRICAL MACHINERY, EQUIPMENT, AND SUPPLIES

Communication Equipment

German

GER. PATENT 715996. ALLGEMEINE ELEKTRIZITÄTS-GESELLSCHAFT, BERLIN. Anordnung für hochfrequenzerzeuger grosser leistung. (Arrangement for high-power high-frequency generators) Application A86127 VIIIa/21a4, Mar 1938. Original inventor: Becker. Jan 1942. 4 p.
Transformer coupled push-pull circuit with an output of approximately 10 kc.

GER. PATENT 722614. ALLGEMEINE ELEKTRIZITÄTS-GESELLSCHAFT, BERLIN. Tragbare sperrenspule (Portable blocking coil). Application 198708 VIIIa/21a4, Aug 1939. Original inventors: Oelkers and Mont. Jul 1942. 4 p.
Device for temporarily grounding high-voltage power lines without interrupting any carrier-current transmissions which may be on these lines.

GER. PATENT 733461. BREUER, KURT (inventor)
Selbsttätige bandbreiteregelung für rundfunkempfänger. (Automatic band-width regulation for broadcast receivers). Application B162590, Dec 1937. Mar 1943. 2 p.

GER. PATENT 728538. HEROLD, KURT and SCHOLZ, WERNER (inventors). Ultrahochfrequenzempfänger mit vorsatzgerät (Ultra high frequency receiver with a convertor). Application B157415 VIIIa/21a4, Oct 1938. Nov 1942. 5 p.
An adaptor to change the received frequency to an intermediate frequency which is then coupled to a receiver by means of a shielded cable.

PB 22500. LEE, H. B., III. Stereophon sound recording system. (Naval Tech Mission in Europe Tech Rept 103-45) Jun 1945. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
This report describes a system intended primarily for high quality sound recording on film. It was privately developed by a German physicist, Dr. Carl Heinz Becker, of Thansau über Rosenheim. The system employs well-known means in some respects, but has the important advantage of giving excellent 3-channel reproduction of great dynamic range and low noise level using a sound track of total width of only 2.65 millimeters. There are two schematic diagrams.

PB 12452. LORENZ (C.) A. G. Telegraphie-mehrkanalsystem mittels einer hochfrequenten trägerwelle (Telegraph-multi-channel system by means of a high-frequency carrier wave). German patent application L101603 VIIIa/21a1 applied Aug. 17, 1940. Aug 12, 1940. 18 p. Price: Microfilm-50¢ - Photostat-$2.00
Drawing and correspondence on subject included.

GER. PATENT 721325. LORENZ (C.) A.G., BERLIN-TEMPELHOF. Modulationsschaltung. (Modulator circuit). Application L96074 VIIIa/21a4, Jun 1938. Original inventors: Bertram and others. Jun 1942. 2 p.

GER. PATENT 721893. LÖWE RADIO A.G., BERLIN-STEGLITZ. Empfangsschaltung mit zwei rückgekoppelten schwingkreisen (Receiving arrangement with two regenerative resonant circuits). Application R89434 VIIIa/21a4, Dec 1933. Original inventor: Schlesinger. Jun 1942. 3 p.

GER. PATENT 723865. LÖWE RADIO A.G., BERLIN-STEGLITZ. Empfange- und verstärkeranordnung mit anschlussmitteln zur wiedergabe von schallplatten (Receiving and amplifying arrangement with an input for the reproduction of records). Application L72794 VIIIa/21a4, Sep 1938. Original inventors: Kunze and Fischer. Aug 1942. 3 p.

GER. PATENT 719108. LÖWE RADIO A.G., BERLIN-STEGLITZ. Transformatorloser universalempfänger. (Universal receiver without transformer) Application R87732 VIIIa/21a4, Apr 1933. Original inventor: Kapteyn. Mar 1942. 4 p.

GER. PATENT 723232. LÖWE RADIO A.G., BERLIN-STEGLITZ. Überlagerungsempfänger unterverwendung einer mehrgittermischröhre. (Heterodyne receiver using a multi-grid mixer tube. Application R95206 VIIIa/21a4, Jan 1936. Aug 1942. 4 p.

GER. PATENT 726513. RADIO MINDE (H.) & CO., DRESDEN. Empfänger mit lautstärkeregelung (Receiver with volume control). Application M128909 VIIIa/21a4, Oct 1934. Oct 1942. 5 p.

GER. PATENT 730352. SACHSENWERK, LICHT- UND KRAFT- A.G., NIEDERSEDLITZ. Rundfunkempfangsgerät mit einstellung auf eine bestimmte anzahl stationen. (Broadcast receiver with push button tuning for a fixed number of stations. Application S133851 VIIIa/21a4, Sep 1938. Original inventor: Wechsung. Jan 1943. 4 p.
A push button tuning device.

GER. PATENT 732901. SCHAUB (G.) APPARATEBAUGES. M. B. H., PFORZHEIM. Rundfunkempfänger, bei dem die bandbreite durch veränderung der bandfilterkopplung geregelt wird. (Broadcast receiver in which the band width is controlled by changing the band-pass filter coupling). Application Sch107236 VIIIa/21a4, Jun 5, 1935. Mar 1943. 3 p.

GER. PATENT 722611. SIEMENS UND HALSKE A.G., BERLIN-SIEMENSSTADT. Anordnung in hochfrequenztelefonieanlagen. (Device for use in high-frequency telephone systems) Application S126289 VIIIa/21a4. Original inventor: Faber. Jul 1942. 4 p.
Device for preventing the receiver alarm to be activated by undesired pulses.

GER. PATENT 722615. SIEMENS UND HALSKE A.G., BERLIN. Anordnung zur ankopplung mehrerer trägerstromkanäle an starkstromleitungen (Method for coupling several carrier-current channels to a power line). Application S112206 VIIIa/21a4, Dec 1933. Jul 1942. 3 p.

GER. PATENT 723364. SIEMENS UND HALSKE A.G., BERLIN-SIEMENSSTADT. Empfänger für frequenzmodulierte wellen. (Receiver for frequency modulated waves). Application S130252 VIIIa/21a4, Jan 1938. Original inventor: Küpfmüller. Aug 1942. 5 p.

GER. PATENT 722611. SIEMENS UND HALSKE A.G., BERLIN-SIEMENSSTADT. Schaltungsanordnung zur trägerfrequenten nachrichtenübertragung über starkstromleitungen. (Circuit for carrier-current communication transmission over power lines.) Application S123986 VIIIa/21a4, Aug 1936. Original inventor: Paessler. Jul 1942. 4 p.

GER. PATENT 715075. SIEMENS UND HALSKE A.G., BERLIN-SIEMENSSTADT. System zur übertragung von rundfunkdarbietungen über einadrige leiter (System for transmission of broadcast programs over single conductor lines). Application S128232 VIIIa/21a4, Jul 1937. Original inventor: Strecker. Dec 1941. 4 p.

GER. PATENT 723398. SIEMENS UND HALSKE A.G., BERLIN-SIEMENSSTADT. Übertragungssystem zum gegensprechverkehr mittels hochfrequenzträgerströme über starkstromleitungen. (Transmission system for two-way communication by means of high-frequency carrier current over power lines.) Application S121374 VIIIa/21a4, Feb 1936. Original inventor: Wolmann. Aug 1942. 5 p.

GER. PATENT 733341. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Anordnung zum gegensprechverkehr. (Arrangement for transceiver operation) Application T46333, Jan 1936. Original inventor: Dietrich. Mar 1943. 4 p.

GER. PATENT 732060. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Bremsfeldschaltung. (Circuit using a repeller field). Application H130352 VIII a/21a4. Jan 1932. Feb 1943. 4 p.

GER. PATENT 721933. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Einrichtung zum ferneinstellen des abstimmittels von hochfrequenzgeräten (Device for the remote control of the tuning mechanism of high frequency equipments). Application T47509 VIIIa/21a4, Sep 1936. Original inventor: Schröder. Jun 1942. 3 p.

GER. PATENT 722165. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Einrichtung zum gegensprechen auf gerichteten kurzen oder ultrakurzen wellen. (Two-way communication equipment operating on beamed short- or ultra-short waves.) Application T48790 VIIIa/21a4, Jun 1937. Original inventor: Kriebel. Jul 1942. 4 p.

GER. PATENT 732762. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Empfänger, dessen niederfrequenzteil zur schallplattenverstärkung verwendet wird. (Receiver whose audio-frequency section is used for the amplification of records) Application T53576 VIIIa/21a4, Mar 28, 1940. Original Inventor: Wilke. Mar 1943. 4 p.

GER. PATENT 728773. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Empfänger für modulierte hochfrequenz. (Receiver for modulated high-frequency) Application T51551 VIIIa/21a4, Dec 1938. Original inventor: Tüxen. Dec 1942. 4 p.

GER. PATENT 732900. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Empfänger mit selbsttätiger verstärkungsregelung. (Receiver with automatic gain control). Application T48547 VIIIa/21a4, Apr 25, 1937. Original Inventor: Feld. Mar 1943. 4 p.

GER. PATENT 728881. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Feldstärke-abhängige bandbreitenregelung. (Band-width control dependent on field strength). Application H164729 VIIIa/21a4, Mar 1941. Original inventor: Hildebrandt. Dec 1942. 3 p.

GER. PATENT 721860. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Hochfrequenz-gegensprechgerät (High-frequency transceiving equipment). Application T52941 VIIIa/21a4, Oct 1939. Original inventor: Hahn. Jun 1942. 3 p.

GER. PATENT 722562. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Hochfrequenz-telephonieeinrichtung für den betrieb auf starkstromleitungen. (High-frequency telephone device for operation on power lines) Application T45865 VIIIa/21a4, Jul 1937. Jul 1942. 2 p.

GER. PATENT 732751. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Schaltung zur verbesserung des wirkungsgrades von modulierten hoch-frequenzsendern. (Circuit arrangement for improving the efficiency of modulated high-frequency transmitters) Application T48645 VIIIa/21a4, May 21, 1937. Original inventor: Hofer. Mar 1943. 7 p.

GER. PATENT 723205. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Schaltungs-anordnung zur aussiebung einer frequenzbenachbarten stör-frequenz. (Circuit arrangement for the filtration of adjacent interfering frequencies) Application T48241 VIIIa/21a4, Feb 1937. Original inventor: Feld. Jul 1942. 3 p.

GER. PATENT 719014. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Sende-empfangs-anordnung zum drahtlosen gegensprechverkehr mit getrenntem sender- und empfängerteil und gemeinsamer antenne. (Two-way radio equipment with separate transmitter and receiver and a common antenna.) Application T44358 VIIIa/21a4, Aug 1934. Original inventor: Thom. Mar 1942. 3 p.

GER. PATENT 722240. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Überlagerungs-empfänger mit abstimmung der hochfrequenzkreise und des überlagerkreises durch induktivitätsänderung. (Heterodyne receiver with a variable induction tuning device for the high-frequency and converter circuits.) Application T51929 VIIIa/21a4, Mar 1939. Original inventor: Preisig. Jan 1943. 3 p.

Japanese

PB 20775. SUPREME COMMANDER FOR THE ALLIED POWERS. RESEARCH AND INFORMATION DIVISION. Outline of administrative system of the Broadcasting Corporation of Japan. (Rept RI-106-RA-B-1). Mar 1946. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
This is an outline chart of the administrative system as of Jan. 21, 1946.

PB 20773. SUPREME COMMANDER FOR THE ALLIED POWERS. RESEARCH AND INFORMATION DIVISION. Supervision of the broadcasting industry. (Rept RI-(T)-13-RA-3). Mar 1946. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translation of pages 94-101 of the Japanese publication "Recent Broadcasting Industry", published in Tokyo, April, 1932, by the Broadcasting Corporation of Japan. The Broadcasting Corporation of Japan is a result of the unification of stations formerly operated in parallel. It was organized with the object of controlling the industry nationally. Thus this corporation is fully equipped to act as a monopoly organization. It is also a nonprofit-seeking organization. The supervision of the government is directed at every possible phase of the broadcasting industry, through its business operations, business facilities, and administrative system. There are two types of expression of the supervisory will of the government: Positive expressions such as orders or directives, and passive expressions such as permissions or recognitions. The government officials directly responsible for these activities are the chief of the communications bureau (Teshin Kyoku), and the communications minister. The report gives an explanation of the supervision of: (a) Administration, (b) business facilities, and (c) administrative functions.

United States

PB 24884. BRUSH DEVELOPMENT COMPANY, CLEVELAND, OHIO. Fourth report on the development of a high frequency strain analyzer. (OSRD Rept 1616). Jun 1943. 6 p. Price: Microfilm-50¢ - Photostat-$1.00

PB 20165, PB 20172, PB 20173, PB 20170, PB 20169, and PB 20171. CANNIN, MADISON. Developmental model of an interference generator for the 2 to 20 megacycle spectrum. Final report and progress reports 1, 3, 4, 5 and 6 to the NDRC: Project 58.

PB No.	Report No.	Date	No. pages	Price: Micro-film	Photo-stat
PB 20165	Final (OSRD 575)	May 1942	90	1.00	6.00
PB 20172	1	Aug 1941	19	.50	2.00
PB 20173	3	Oct 1941	15	.50	1.00
PB 20170	4	Dec 1941	7	.50	1.00
PB 20169	5	Feb 1942	14	.50	1.00
PB 20171	6	Apr 1942	6	.50	1.00

These reports describe the development of an interference generator consisting of a panoramic receiver and a transmitter for use in the frequency spectrum 2 to 20 megacycles, and having a power output of approximately 25 watts. The major features of this apparatus are described, and a brief report of performance tests is given, in the final report. The equipment is designed to interfere with transmissions of AM or FM speech, and to a considerable extent with CW and ICW signals. A recommendation for the design of a production model, based on this development, is included in the final report. An instruction book for the development equipment forms a part of the final report. The instruction book discusses the design and operation of the equipment, and includes schematic circuits, photographs, and adjustment data. This work was done at the Farnsworth Television and Radio Corporation, Ft. Wayne and Marion, Indiana.

In the development of a high frequency analyzer called for by the project covered in this report, a system was chosen which makes use of an endless magnetic recording medium upon which the transient signal is impressed. This report covers work done to obtain an endless medium for magnetic recording suitable for this application. An iron-cobalt alloy was plated on a nonmagnetic manganese steel base. Oscilloscope pictures of pulses recorded on a standard steel disc and on a plated Inconel disc are included in the report. The work was carried on at the Brush Development Company and is a continuation of earlier experiments.

PB 24883. CORK, J. M. Report on the magnetic disc plating derived under contract no. OEMsr-254. (OSRD Rept 1946). Dec 1943. 10 p. Price: Microfilm-50¢ - Photostat-$1.00

This report indicates that it is now possible by an electroplating process to produce discs as used in magnetic recording which are quite superior to the currently used rolled steel discs. The magnetic iron-cobalt alloy, the plating process and the nonmagnetic base material are discussed. A schematic drawing and oscilloscope pictures of pulses recorded are included in the report. The work was carried on at The Brush Development Company.

PB 22913. EGAN, J. P. and others. The articulation efficiency of nine carbon microphones for use at low altitudes. (OSRD Rept 3515). 73 p. Price: Microfilm-$1.00 - Photostat-$5.00

This report presents the results of a series of tests designed to cover the principal carbon microphones available for use at low altitudes. Articulation tests were used as they measure directly and reliably the efficiency with which the various microphones transmit speech. Tests were conducted in an ambient noise (120 db) under conditions simulating conditions of actual use. From the point of view of articulation, comfort, and convenience, the noise-cancelling type D-173264 (Western Electric) microphone and the AMB-M-C1 microphone in either the D-17 or the BTL noise shield are superior to any of the other carbon microphones tested. They are reasonably comfortable to wear, convenient to use, and provide high intelligibility even when used by inexperienced talkers. The two most important factors affecting intelligibility are the frequency response of these microphones and the extent to which they pick up the ambient noise. Diagrams and photographs are included.

PB 22858. EGAN, J. P. and NEWMAN, E. B. Maximum permissible level of microphonic noise in aircraft radio receivers. (NDRC Res on Sound Control Informal Communication 109) Jun 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00

This report presents measurements of the threshold of audibility for pure tones fed as signals into the standard Navy headset, and shows that the threshold for a microphonic noise having one or more predominant frequencies can be predicted on the basis of the pure-tone threshold for the single frequency which first reaches the corresponding pure-tone threshold. Diagrams are included.

PB 22782. IDE, JOHN M. Report on an underwater loud-speaker for audio frequencies, model X-2. (Naval Res Lab Rept S-1882). Jun 1942. 30 p. Price: Microfilm-50¢ - Photostat-$2.00

The report describes the design, construction, and performance of an underwater loud-speaker of magnetic type. Good reproduction of complex sounds such as music or propeller noises can be obtained from the speaker. When mounted on the USS AQUAMARINE, the speaker delivered to a microphone on the bottom directly beneath it, in 96 feet of water, a sound pressure of 120 db (200 dynes/cm^2), with fair uniformity over the frequency range 200 to 1200 cps. A later model is described in PB 22783.

PB 22783. IDE, JOHN M. Report on underwater loud-speaker for low audio frequencies, model X-3. (Naval Res Lab Rept S-1900). Jul 1942. 24 p. Price: Microfilm-50¢ - Photostat-$2.00

This report describes the design, construction, and performance of an underwater loud-speaker of magnetic type. The design of this model, designated X-3, is greatly simplified in comparison with that of an earlier model, X-2, described in NRL Report S-1882 (PB 22782). The speaker is characterized by maximum response in the frequency range 200-500 cps. In this range a sound output level of 140-145 DB (2000-3600 dynes /cm^2) may be obtained at a microphone 12 feet distant. Diagrams, charts, and graphs are included.

PB 22859. KRYTER, K. D. and others. Advantages of clipping the peaks of speech waves prior to radio transmission. (NDRC Res on Sound Control Informal Communication 83). Oct 1944. 31 p. Price: Microfilm-50¢ - Photostat-$3.00

The purpose of this study was to evaluate, by articulation testing methods, the effects of the peak clipping of speech prior to radio transmission. The speech signal was transmitted by a radio frequency carrier wave, amplitude modulated, and then detected with a standard radio receiver. Tests were performed in the quiet, in an ambient airplane noise of 120 db intensity, and in the presence of static interference. At weaker signal levels, intelligibility was increased by preclipping. Oscillograms, curves, and diagrams illustrate the report, which is from the Psycho-Accoustic Laboratory, Harvard University.

PB 22857. LICKLIDER, J.C.R. and others. Articulation tests of the Wasmansdorff noise-peak limiter. (NDRC Res on Sound Control Informal Communication 84). Sep 1944. 56 p. Price: Microfilm-$1.00 - Photostat-$4.00

Tests have been conducted to evaluate the effectiveness of a noise-peak limiter designed for use with Naval radio receivers to reduce the detrimental effects of static. The Wasmansdorff half-wave limiter was tested in an ARB Naval aircraft receiver. It is designed to clip the audio wave at 0 predetermined amplitude level. This level is adjusted so that, in the absence of interfering noise, only the extreme peaks of the speech signal are affected. Intelligibility was markedly improved in tests with static as the only interfering noise. The limiter was not effective when a considerable amount of low-peak-factor noise is present in the received signal. Further tests are being carried out by the Harvard Psycho-Acoustic Laboratory. Diagrams and graphs are included.

PB 23515. MAC MASTERS, MARVIN M. Report of tests performed with radio receiver BC-966-A and control box BC-255-A, part of radio set SCR-695-A, while operating in a chamber in which combustible gases were present. (AAF ATSC Memo Rept TSELM-35). Feb 1946. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
Experiments proved that Radio Receivers BC-966-A, BC-966-AB, BC-966-B and Radio Control Units RC-255-A and RC-255-B were free, during normal operation, from a source of ignition for explosive vapors that may be ambient to the equipment when installed in aircraft.

PB 23412. SCHWARTZ, LEONARD S. and DOLPH, CHARLES L. An analysis of the tolerances in a pulse operated radio-relay system. n.d. 48 p. Price: Microfilm-50¢ - Photostat-$4.00
Useful formulas for the summation of random errors have been derived by the Method of Characteristic Functions. These have been applied in a study of the relaxation of tolerances in a pulse operated radio-relay system with particular reference to (1) frequency drifts (2) pulse width and spacing errors (3) impedance mismatches in test equipment (4) receiver dynamic range tolerances. The statistical method proves useful, also in serving as a guide to modifications in design, as is seen in the study of impedance mismatches in test equipment. The Appendix gives the mathematical development of the data.

PB 24919. U.S. BUREAU OF SHIPS. Instruction book for model RA radio equipment. (Manufactured by General Electric Co., West Lynn, Mass.). (General Electric Instruction 18817; SHIPS 231). May 1942. 87 p. Price: Microfilm-$1.00 - Photostat-$4.00
The model RA equipment is an adaption for shipboard use of the model ABA-1 radio recognition equipment designed for aircraft installation. When receiving a 470 mc pulse-modulated signal, it will automatically re-transmit the pulse signal on a carrier frequency of 493.5 mc. When receiving a 470 mc, 30 kc.-modulated signal; it will automatically operate the local visual reply apparatus, and sound the "warning buzzer" to signify reception of a challenge signal. Description of the equipment and list of component parts are followed by instructions for installation, adjustment, operation and maintenance. Tables presenting parts and spare parts lists by symbol designation, color code chart and list of manufacturers, as well as photographs, outline drawings and schematic diagrams are included. The equipment consists of the radio transmitter-receiver unit, the remote control unit, the motor generator set and the antennas.

PB 23667. U. S. WAR DEPARTMENT. Converter CV-2/TX, repair instructions. (Tech Manual 11-4021) Jun 1945. 57 p. Price: Microfilm-$1.00 - Photostat-$4.00
Converter CV-2/TX is designed to operate with Facsimile Equipment RC-120-A, RC-120-B, and Facsimile Set AN/TXC-1 when this equipment will function over long distance radio channels where fading is encountered. When sending, Converter CV-2/TX converts the a-m signals from Facsimile Transceiver FX-1 to f-m signals having a range between 1,800 and 3,000 cycles. The output signal level is adjustable up to a maximum of 2.5 volts, and the minimum signal level of -40 dbm on the line input terminal is required. This manual gives instructions for the repair of the equipment, with diagrams, tables, and photographs.

PB 23465. U. S. WAR DEPARTMENT. Installation of radio and facsimile equipment in car, half-track M2Al. (Tech Manual 11-2718) Jun 1945. 54 p. Price: Microfilm-$1.00 - Photostat-$4.00
This manual provides methods and procedure for installation of radio sets SCR-193-G, 284, 506, 508, 510, 528, 593, 608, 610 and facsimile equipment RC-58 in half-track car M2Al. Items required to make a complete operating installation are listed for each set. Diagrams illustrate the various parts of each set.

PB 23466. U. S. WAR DEPARTMENT. Installation of radio and facsimile equipment in carrier, personnel, half-track, M3Al. (Tech Manual 11-2721) May 1945. 49 p. Price: Microfilm-50¢ - Photostat-$4.00
This manual provides methods and procedure for installation of radio sets SCR-193T, 506, 508, 510, 528, 608, and 610 and facsimile equipment RC-58 in the half-track personnel carrier M3Al. Items required to make a complete operating installation are listed for each set. Diagrams show installation.

PB 23467. U. S. WAR DEPARTMENT. Installation of radio and facsimile equipment in truck, 3/4-ton, 4 x 4, command reconnaissance. (Tech Manual 11-2726) Mar 1945. 58 p. Price: Microfilm-$1.00 - Photostat-$4.00
This manual provides methods and procedures for assembly and installation of radio sets SCR-193Q, 245T, 506, 508, 510, 528, 608, 610, 628 and facsimile equipment RC-58 in the 3/4 ton, 4 x 4, command reconnaissance truck. Items required to make a complete operating installation are listed for each set. Diagrams illustrate all steps in the installation.

PB 23464. U. S. WAR DEPARTMENT. Installation of radio and interphone equipment in car, scout, M 3Al. (Tech Manual 11-2717) Dec 1944. 68 p. Price: Microfilm-$1.00 - Photostat-$5.00
This manual provides methods and procedure for installation of radio sets SCR-193D, 284, 506, 508, 510, 528, 593, 608, 610 and 628 in scout car M3Al. Items required to make a complete operating installation are listed for each set. Diagrams illustrate the manual.

PB 23461. U. S. WAR DEPARTMENT. Installation of radio equipment in carrier, personnel, half-track, M5 or M5Al. (Tech Manual 11-2711) Sep 15, 1944. 25 p. Price: Microfilm-50¢ - Photostat-$2.00
This manual provides methods and procedures for assembling and installing radio set SCR-510, or SCR-610 and radio set SCR-506 in combination with radio set SCR-508, SCR-528, SCR-608, or SCR-628 in half-track personnel carrier M5 or M5Al. Items required to make a complete operating installation are listed for each radio set. Diagrams illustrate the manual.

PB 23463. U. S. WAR DEPARTMENT. Installation of radio equipment in truck, 1/4-ton, 4 x 4. (Tech Manual 11-2715) Sep 30, 1944. 78 p. Price: Microfilm-$1.00 - Photostat-$6.00
This manual provides methods and procedures, based upon actual field experience, for installation of radio sets SCR-193-K, 193-KB, 193-KN, 284, 506, 508, 528, 608, 628, 808, 828, 510, 610, and AN/VRC-1 in the 1/4 ton, 4 x 4, truck. Items required to make a complete operating installation are listed for each radio set. Diagrams illustrate the manual.

PB 23430. U. S. WAR DEPARTMENT. Intermediate and high frequency receiver, model AR-8506-B. (Tech Manual 11-875) Aug 22, 1944. 45 p. Available from the Supt Docs, Washington 25, D. C. 15¢
This manual describes the subject receiver and gives instruction for installation, operation and maintenance of the equipment. The model AR-8506-B is a five band intermediate and high frequency radio receiver with a range from 85 kc. to 25 mc; designed for service aboard ships or in land stations. It uses a 10 tube superheterodyne circuit and has a triple stage 1700 kc. intermediate frequency amplifier. It operates on 115 or 230 volts d.c. or a.c. power supply. Photographs, graphs, and circuit diagrams illustrate the manual.

PB 23663. U.S. WAR DEPT. Keyer KY-7/FRT. (Tech Manual 11-2669). Sep 1945. 63 p. Price: Microfilm-$1.00 - Photostat-$5.00

Keyer KY-7/FRT is a unit designed to adapt any type of keyed radio transmitting equipment to tone-keying operation. The keyer, intended for use with a 500-ohm keying line, provides a keyed negative output voltage of from 0 to 115 volts. A keying tone of about 1,000 cycles at an input level between -15 and +10 decibels is required for dependable keying. Photographs, diagrams, and tables aid in the presentation of instructions for installation, operation, maintenance and repair of the subject equipment.

PB 23455. U.S. WAR DEPARTMENT. Radio receiver and transmitters BC-611-A, B, -C, -D, -E, and -F; repair instructions. (Tech Manual 11-4019). Jul 1945. 68 p. Available from the Supt Docs, Washington 25, D.C. 25¢
This equipment is designed for short-range two-way voice communication. It is a press-to-talk portable radiotelephone, receiving and transmitting on the same frequency. The set is designed to operate over distances from 100 feet to one mile. The maximum range may be considerably greater when operating over water or from a plane. The unit is crystal-controlled on both reception and transmission and will operate over the frequency range of 3,500 to 6,000 kilocycles. However, each unit is adjusted to operate at only one frequency in this band. The set is battery powered. Detailed descriptions of the various parts are given, together with instructions for repair, trouble-shooting procedures, individual stage and circuit repair data, over-all performance tests, and supplementary data. Numerous photographs, drawings, tables, and wiring and schematic diagrams are included.

PB 23456. U. S. WAR DEPARTMENT. Radio receiver and transmitters BC-620-A,-B,-F,-G,-H, and -J; repair instructions. (Tech Manual 11-4022) Jun 1945. 59 p. Available from the Supt Docs Washington 25, D. C. 25¢.
Radio Receiver and Transmitter BC-620 is designed for short-range two way voice communication. It is a low power, portable, frequency-modulated radio receiver and transmitter with interrelated components. The set is designed to operate over distances up to 5 miles, over a frequency range from 20,000 to 27,900 kc. This manual of repair instructions contains photographs, diagrams, and tables.

PB 23454. U. S. WAR DEPARTMENT. Radio receiver and transmitters BC-745-A, B,-C,-D, and -E; repair instructions. (Tech Manual 11-4018) Jun 1945. 57 p. Available from the Supt Docs Washington 25, D. C. 20¢.
Radio receiver and transmitters BC-745-A,-B,-C,-D, and -E are low power, portable, amplitude-modulated voice-communication sets powered by either dry or wet batteries. The chassis base and housing of each set is located near the top of a 3-foot hollow metal staff which houses a three-section 90-inch telescoping antenna. It operates on specific channels in the frequency range from 2,000 to 6,000 kc. in an operating range of 5 miles. Diagrams and photographs add to the textual instructions for the repair of all parts of the equipment.

PB 23483. U. S. WAR DEPARTMENT. Radio set AN/CRD-3, and addenda. (Tech Manual 11-513) Jul 1945. 294 p. Price: Microfilm-$3.00 - Photostat-$20.00
Radio set AN/CRD-3, described in this instruction manual, consists of a receiving and indicating system, crossed-U Adcock antennas, a sense antenna, and accessory equipment. It is designed for medium-frequency radio direction finding, transportable by air or vehicle, and may be operated from (commercial power or from) the power generator supplied with the radio set. It operates on a frequency range from 250 to 1,500 kc. Tables, photographs and diagrams are included.

PB 23445. U. S. WAR DEPARTMENT. Radio set AN/TPS-3 service manual; theory and trouble shooting. (Tech Manual 11-1540) Mar 1944. 231 p. Available from the Supt Docs Washington 25, D. C. $1.00
Radio set AN/TPS-3 is a 600-megacycle, light-weight, radar set designed chiefly for medium-long-range early-warning against aircraft. Basically the set is radar search unit which transmits a high-power, short-duration r-f pulse, and then receives signals from objects capable of reflecting back part of the r-f energy in the transmitted pulse. The received energy is applied to visual indicators which show the distance in miles and the azimuth bearing in degrees of the objects causing the reflection. Diagrams, tables, and photographs are included.

PB 23486. U. S. WAR DEPARTMENT. Radiotelegraph transmitter (press wireless type PW-981-A). (Tech Manual 11-834) Feb 1945. 118 p. Price: Microfilm-$1.50 - Photostat-$8.00
Radiotelegraph transmitter is designed for radioteletype and telegraph operation over a frequency range of 2.5 to 23 mc., and is capable of being keyed at speeds up to 150 words per minute. The transmitter operates on a three-phase power source of 220/230 volts, 50/60 cycles. The rated carrier output of the transmitter is 2,500 watts, and power consumption is about 8 kw. This manual presents instructions for the installation, operation, and maintenance of the equipment, and contains diagrams, photographs, and tables.

PB 23484. U. S. WAR DEPARTMENT. Radio transmitter telegraph-telephone SST-101. (Tech Manual 11-834) Feb 1944. 83 p. Price: Microfilm-$1.00 - Photostat-$6.00
Radio transmitter SST-101 is designed for radio telegraph or telephone operation over a frequency range of 2.1 to 18 mc. On telegraph operation it is capable of being keyed at speeds up to 150 words per minute. The transmitter will deliver a maximum of 400 watts of completely modulated radio frequency carrier for radio phone operation or 600 watts of continuous wave radio telegraph carrier into a balanced two-wire line of about 600 ohms impedance. This manual, replete with diagrams, photographs, and tables, provides instructions for the installation, operation and maintenance of the equipment.

PB 22020. U.S. WAR DEPARTMENT. Speech recorder MC-502, and addenda dated Jan 1, 1945. (Tech Manual 11-2542). Nov 1944. 179 p. Price: Microfilm-$2.00 - Photostat-$12.00
Speech recorder MC-502 is a portable recorder-reproducer consisting of dual recording-reproducing units and an associated record-reproducing amplifier, all contained in a single field case. This equipment is designed to afford continuous recording of voice and code signals, and reproducing simultaneously with, or separately from, recording. A cylindrical record is used which permits constant groove speed. Diagrams, tables and photographs aid instructions for the installation, operation, and maintenance of the equipment.

PB 23477. U. S. WAR DEPARTMENT. Tape facsimile equipment RC-58-B. (Tech Manual 11-374) Feb 1944. 148 p. Price: Microfilm-$1.50 - Photostat-$10.00
Tape facsimile equipment RC-58-B consists of a combination recorder and scanner unit with its associated amplifier, connecting cables, and auxiliary equipment. The equipment is designed for operation from a 12-volt d-c power source, but conversion to 24-volt d-c operation may be made by slight changes. Messages, handwritten or typed on a paper tape, are transmitted by this equipment to or from similar equipment at other locations. Diagrams, tables, and photographs are included.

PB 22017. U.S. WAR DEPARTMENT. Technical manual for transmitting components of radio set SCR-197-C, radio set SCR-197-D and radio set SCR-197-F. (Tech Manual 11-805). Jun 1942. 121 p. Price: Microfilm-$1.50 - Photostat-$9.00

The transmitting components of Radio Set SCR-197-C are installed in Truck K-18-C and those of Radio Set SCR-197-D are installed in Truck K-18-D. Each truck comprises a complete portable radio transmitting station for ground use by large field organizations. The transmitting components of Radio Set SCR-197-C or Radio Set SCR-197-D are intended to provide radio transmission over a frequency range of 1,500 to 18,000 kc. using continuous waves, tone modulated waves or voice modulated waves. Power for the operation of the various units can be supplied from a commercial source of 110 or 220 volts, 60 cycles, single phase or from the included emergency generator. Tables, diagrams, and photographs supplement instructions for the functioning of parts, and the maintenance of the equipment.

PB 22661. WEEDFALL, W. W. and others. Research on sound control: 1. Thin headphone for use under M-1 helmet; 2. German handset HAP-2; 3. Submarine voice tube system. (OSRD Rept 1805; NDRC Rept 17.3:26). Sep 1943. 36 p. Price: Microfilm-50¢ - Photostat-$3.00
Preliminary designs toward a thin headphone set for use by the Marine Corps are described in part I. In part II tests were made of a captured German hand telephone set in which the microphone and headphone are mounted very close together and the output of the headphone conducted through a tube to the ear, thus permitting a thin earpiece. The third part describes a preliminary investigation of difficulties encountered in voice tube communication between the bridge and conning tower of current submarines. Recommendations for improved design are made. Photographs, drawings and graphs illustrate the report. The studies were made at the Cruft Laboratory, Harvard University.

Electronics

German

GER. PATENT 731004. BLAUPUNKT-WERKE G. M. B. H., BERLIN-WILMERSDORF. Elektrisches nachrichtengerät mit einer den betrieb an stromquellen verschiedener spannung ermöglichenden schaltvorrichtung. (Electric communication equipment with a switching device for operation from power sources with different voltages.) Application B193275 VIIIa/21a4, Feb 1941. Original inventors: Weiland and others. Jan 1943. 5 p.

GER. PATENT 729147. BLAUPUNKT-WERKE G.M.B.H., BERLIN-WILMERSDORF. Magnetfeldröhre für einen empfänger. (Magnetron tubes for a receiver.) Application I62075 VIIIa/21a4, Jul 1938. Original inventors: Zerbs and others. Dec 1942. 3 p.

GER. PATENT 726588. BLAUPUNKT-WERKE G.M.B.H., BERLIN-WILMERSDORF. Schaltungsanordnung für auf verschiedene wellenlängen umschaltbare magnetfeldröhrensender (Circuit for switching a magnetron transmitter to different wave lengths). Application I62898 VIIIa/21a4, Nov 1938. Original inventors: Göllner and Müller. Oct 1942. 3 p.

GER. PATENT 733426. FERNSEH G.M.B.H., BERLIN-ZEHLENDORF. Anordnung zur verstärkung ultrahochfrequenter schwingungen und nachfolgender gleichrichtung unter verwendung eines reihenvervielfachers (Sekundärelektronenemissionsverstärkerröhre) (Arrangement for the amplification and subsequent rectification of ultra high frequency oscillations by use of a series multiplier (electron multiplier tube)). Application F87459, Sep 1939. Original inventor: Flechsig. Mar 1943. 3 p.

GER. PATENT 714545. FERNSEH G.M.B.H., BERLIN-ZEHLENDORF. Induktives übertragungsglied zur wahlweisen übertragung zweier wellenbereiche. (Inductive coupling for the selective transmission of two wave bands). Application F87751 VIIIa/21a4, Dec 1939. Original inventor: Rudert. Jan 1942. 4 p.

PB 18753. GERMANY. REICHSFORSCHUNGSRAT. Strahlungstechnik "ultrarot" (Correspondence on research projects in optics and physics, with reports on ultra-red and ultra-violet). (ALSOS Mission, Gerlach 5) 1944-1945. 103 p. Price: Microfilm-$1.50 - Photostat-$7.00
In this file several problems of the filterability of the air are discussed. A project for using ultra-violet beams of an Hochstromkohlebogen (high voltage carbon arc) for search lights is developed by Prof. Finkelnburg (Strassburg). Prof. Koschmieder (Potsdam) reports on the range of search lights under consideration of atmospheric cloudiness. Gerätentwicklung Danzig G.m.b.H. is concerned with secret tasks for the Army and Navy, among others with experiments on remote control through ultra-violet light impulses. Much other correspondence on related subjects is also included.

PB 25635. GROSS, MALVERN J. Betatron development in Germany. (FIAT Final Rept 534). Nov 1945. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report states that, based on information from a number of sources, it is well established that there were only two groups in Germany that had completed the construction of Betatrons (magnetic induction electron accelerators) to the point of getting them into operation. In general, it seems that Betatron development in Germany was far behind that in the United States. Nevertheless, some of the work is different from that tried in the United States and some of the theoretical speculation may be of interest. The work of the following organizations and persons is summarized: K. W. Research Association, Siemens-Reininger Werke, Dr. Max Steenbeck, Dr. R. Wideroe, K. W. Institut, University of Heidelberg, Allgemeine Elektrizitäts Gesellschaft, Drs. Kopfermann and Gundt at the University of Göttingen, and Dr. Schmellenmeier and Professor Ganz. Miscellaneous technical notes, and a list of documents evacuated to Washington, are also included.

PB 25695. KINGMANN, JOHN P. Adaptation of mine detector principles to proximity fuse for rockets, glider bombs, etc. (BIOS Halstead Exploiting Centre Rept 5409). Jul 1945. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
The recommendations of a German mine detector expert concerning the application of the principles of inductive and capacitive detection to proximity fuses are presented in the translation of a report written by Dr. H. Weller, of Deutsche Forschungsanstalt für Segelflug. The author proposed the adaptation of a mine detector produced by the firm of Felten & Guilleaume Carlswerk, A.G. Cologne-Mühlheim, for use as a proximity fuse, and describes the proposed method of adaptation in detail. The device has high sensitivity, uses the heterodyne method with few circuit elements and only one tube, and has the advantage of simplicity of construction and low cost.

GER. PATENT 724447. KRAMOLIN, LADISLAUS VON (inventor). Verfahren zur abstimmung von schwingungskreisen (Method of tuning resonant circuits). Application K143952 VIIIa/21a4, Oct 1936. Aug 1942. 2 p.

GER. PATENT 711737. KUPFER-ASBEST-CO., BACH (GUSTAV), HEILBRONN. Einbaufertige gehäuselose wellendichtung zur abdichtung gegen zersetzende flüssigkeiten und gase. (A pre-fabricated shaft seal without retainer for use as a packing against deteriating liquids and gases). Application K150196XII/47f, Apr 2, 1938. Original inventor: Haug. Oct 6, 1941. 5 p.

PB 22306. KURSKE, H. and SOTTGARDT, J. Experiments about growing of special Rochelle salt crystals. (AAF ATSC T-2 Translation 482) Oct 1945. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Research conducted at the Research Institute of Physics revealed that it is possible to obtain electrodes ingrown in Rochelle salt for application for detonators. If it is possible to eliminate the effect of poor insulation, this method might have possibilities for mass production, which the building up of piles from separate crystals does not have. This report is a translation of a German article published in Technische Berichte, vol. 11, No. 6, 1944.

PB 12448. LORENZ (C.) A. G. Anordnung zum ausgleich von stellungsunterschieden zwischen geber und empfänger bei fernsteuerungseinrichtungen (Arrangement to compensate the difference in settings between transmitter and receiver in remote control installations). German patent application L102587 VIIIb/21c applied Dec. 6, 1940. Dec 6, 1940. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
Drawing missing, correspondence on subject included.

PB 12449. LORENZ (C.) A. G. Anordnung zum ausgleich von stellungsunterschieden zwischen geber und empfänger bei fernsteuerungseinrichtungen (Arrangement to compensate the difference in settings between transmitter and receiver in remote control installations). German patent application L102588 VIIIb/21c applied Dec. 6, 1940. Dec 6, 1940. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
Drawing and correspondence on subject included.

GER. PATENT 731312. LORENZ (C.) A.G., BERLIN-TEMPELHOF. Antennengebilde mit vorzugsweise allseitiger bodenstrahlung für rundfunkzwecke. (Antenna structure for broadcast purposes with omni-directional ground radiation. Application L87320 VIIIa/21a4, Jan 1935. Feb 1943. 3 p.

GER. PATENT 731237. LORENZ (C.) A.G., BERLIN-TEMPELHOF. Empfangsverfahren für leitstrahlsender. (Method for the reception of beacon transmitters.) Application L94709 VIIIa/21a4, May 1938. Original inventor: Kramar. Feb 1943. 5 p.

GER. PATENT 731348. LORENZ (C.) A.G., BERLIN-TEMPELHOF. Funkbakenanordnung zur navigation über grosse entfernungen mit rotierendem leitstrahl. (Radio beacon arrangement with rotating beam for navigation over great distances. Application L90609 VIIIa/21a4, Jul 1936. Feb 1943. 4 p.

GER. PATENT 730449. LORENZ (C.) A.G., BERLIN-TEMPELHOF. Hochfrequenzspule mit einem eisenkern. (High frequency coil with an iron core) Application L88961 VIIIa/21a4, Oct 1936. Jan 1943. 1 p.

GER. PATENT 722193. LÖWE RADIO A.G., WERK LEIPZIG, LEIPZIG. Automatische peileinrichtung. (Automatic direction finder) Application D77407 VIIIa/21a4, Mar 1938. Original inventor: Weber. Jul 1942. 5 p.

GER. PATENT 719146. LÖWE RADIO A.G., BERLIN-STEGLITZ. Bandfilteranordnung mit veränderlicher bandbreite. (Band-pass filter arrangement with variable band width. Application R96783 VIIIa/21a4, Jul 1936. Original inventor: Stoff. Mar 1942. 3 p.

PB 25267. MARIS, F., tr. Lichtenstein (radar calibration). (BIOS Halstead Exploiting Centre Rept 246). Jan 1946. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
This report contains five photographs for the Experimental Station for Wireless Telegraphy and Atmospheric Electricity in Gräfelfing, near Munich. These photographs were taken in August 1941 with two cameras, working synchronously, one installed in one airplane to take pictures of the oscillograph and the other in another airplane to take pictures of the airplane being followed. By comparing the adjacent photographs and measuring the dimensions of the picture of the airplane, the apparatus used could be calibrated, that is to say, a certain oscillogram could be allotted to a certain distance.

PB 27712. OWEN, E. R. Telefunken Gesellschaft für Drahtlose Telegraphie m.b.H., Berlin; special materials for radio valves. (BIOS Final Rept 276, Item 7) Oct 1945. Oct 1945. 22 p. Price: Microfilm-$1.00 - Photostat-$2.00
The Telefunken organization made from 30% to 40% of the total production of radio valves in Germany and occupied countries during the war. Including the occupied countries Telefunken had eight valve factories, the one in Berlin having the largest production. At the Berlin factory the Company developed the application in radio valves of certain special metals, particularly thorium, zirconium, and aluminium - Plated iron for electrodes, getters, etc. This report describes the fabrication and methods of application of these special metals. The rates of production of valves in terms of R. M. per month at the various Telefunken factories during 1943 and 1944 are shown in Appendix I. Appendix II consists of a table of principal metals used in radio valves.

GER. PATENT 726512. PHILIPS PATENTVERWALTUNG G.M.B.H., BERLIN. Schaltung zur verstärkung hochfrequenter elektrischer schwingungen (Circuit for the amplification of high-frequency electric oscillations). Application N40168 VIIIa/21a4, Dec 1936. Original inventor: Sablonière. Oct 1942. 4 p.

GER. PATENT 718958. PHILIPS PATENTVERWALTUNG G.M.B.H., BERLIN. Schaltung zur verstärkung von modulierten hochfrequenzschwingungen. (Circuit for the amplification of modulated high-frequency oscillations.) Application N41264 VIIIa/21a4, Oct 1937. Original inventor: Posthumus. Mar 1942. 8 p.

GER. PATENT 731698. PHILIPS PATENTVERWALTUNG G.M.B.H., BERLIN. Schaltungsanordnung für mehrstufige hochfrequenzverstärker. (Circuit arrangement for a multi-stage high-frequency amplifier.) Application N37039 VIIIa/21a4, Aug 1934. Original inventors: Tellegen and others. Feb 1943. 4 p.

GER. PATENT 731417. PINTSCH (JULIUS) KOM. - GES., BERLIN. Gruppenstrahleranordnung für ultrakurze wellen. (Radiator group for ultra-short waves.) Application P79654 VIII a/21a4, Aug 1939. Feb 1943. 3 p.

GER. PATENT 731699. PINTSCH (JULIUS) KOM. - GES., BERLIN. Ultrakurzwellensende- und -empfangsanordnung mit reflektor. (Ultra-short wave transmitting and receiving arrangement with a reflector.) Application N36535 VIIIa/21a4, Mar 1934. Feb 1943. 3 p.

GER. PATENT 728772. SIEMENS UND HALSKE A.G., BERLIN-SIEMENSSTADT. Messgenerator. (Signal generator) Application S139047 VIIIa/21a4, Nov 1939. Original inventor: Otto. Dec 1942. 4 p.

GER. PATENT 733521. SIEMENS UND HALSKE A.G., BERLIN-SIEMENSSTADT. Schaltungsanordnung zur erzeugung einer schwingung und gleichzeitigen verstärkung elektrischer schwingungen anderer frequenz in derselben entladungsstrecke. (Circuit for the generation of oscillations and the simultaneous amplification of electric oscillations of another frequency in the same load.) Application S131262, Mar 1938. Original inventor: Freystedt. Mar 1943. 4 p.

GER. PATENT 730295. SIEMENS UND HALSKE A.G., BERLIN-SIEMENSSTADT. Schaltungsanordnung zur schwingungserzeugung und gleichzeitigen verstärkung einer elektrischen schwingung anderer frequenz in derselben entladungsstrecke. (Circuit for the generation of oscillations and the simultaneous amplification of electric oscillations of another frequency in the same load). Application S131263 VIIIa/a21a4, Mar 1938. Original inventor: Graf. Jan 1943. 4 p.

GER. PATENT 732902. SIEMENS UND HALSKE A.G., BERLIN-SIEMENSSTADT. Überspannungsschutzeinrichtung für ultrakurzwellenleitungen. (Over-voltage protection device for ultra short wave lines). Application S136555 VIIIa/21a4. Original inventor: Hagenhaus. Mar 1943. 3 p.

PB 27439. SPICKELMIRE, JOHN R. Report on German scientific library of the BHF (Bevollmächtigte für Hochfrequensforschung). Mar 1946. 261 p. Price: Microfilm-$6.00 - Photostat-$18.00
This report is a detailed index of the Library of the German Plenipotentiary for High Frequency Research. The Library contained some 2,400 selected classified research reports on high frequency technique, communications, radar and related fields. Titles are given both in English and in German. The documents were evacuated to the Central Radio Bureau, London, England, where they were microfilmed and individual abstract reports were prepared on each document. The original microfilm negative of the entire library together with copies of the abstract reports have been forwarded to the Joint Intelligence Objectives Agency, War Department, Washington. The original BHF filing system of separating the documents into 21 major classifications has been maintained, and the main sections have been further divided into subsections readily identified by the serial number of the extracts. Each document carries a serial number which identifies it as to main and subsection classification.

GER. PATENT 720438. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Abschluss- oder koppelbrücke für konzentrische hochfrequenzleitungen. (Terminal or coupling bridge for high-frequency concentric lines.) Application T48686 VIIIa/21a4, Jun 1937. Original inventor: Hollmann. May 1942. 3 p.

PB 10987. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Anordnung zur ansteuerung eines vorgegebenen zieles für flugzeuge. (An arrangement for directing aircraft to a predetermined goal) German patent application T60116 VIII a/21al applied for Feb 24, 1944 and still pending. Original inventor: Kettel. 1944. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
Drawing missing.

PB 10988. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Anordnung zur beobachtung eines blickfeldes bei unsichtigem wetter, insbesondere für flugzeugführer. (An arrangement for the control of the field of vision during low visibility weather, especially for aircraft pilots). German patent application T60115 VIII a/21al applied for Feb 24, 1944 and still pending. Original inventor: Muth. 1944. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Drawing missing.

GER. PATENT 723423. TELEFUNKEN GESELLSCHAFT FÜR DRAHLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Anordnung zur kompensation der horizontal polarisierten komponente im sende- oder empfangsfeld einer vertikalantenne. (Arrangement for the compensation of the horizontally polarized component in the transmitting or receiving field of a vertical antenna.) Application T51508 VIIIa/21a4, Dec 1938. Original inventor: Bergtold. Aug 1942. 3 p.

PB 8541. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Anordnung zur seitenbestimmung. (Arrangement for sense determination). German patent 728778 applied for Nov 29, 1939 with number T53132 VIII a/21a4. Original inventor: Thiel. 1939. 8 p.
Price: Microfilm-50¢ - Photostat-$1.00

PB 9040. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Aus sender und empfänger bestehendes rückstrahlgerät. (A radar equipment consisting of a transmitter and receiver). German patent application T57087 VIII a/21a4, Mar 20, 1942, still pending. Original inventor: Johnske. 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Illustrated.

GER. PATENT 726616. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Ausfahrbare antenne mit einem nach art der bandmasse spiralförmig aufwickelbaren antennenleiter (Unreeling antenna with a helically wound antenna conductor, similar to a measuring tape). Application T50402 VIIIa/21a4, May 1938. Original inventer: Richter. Oct 1942. 3 p.

GER. PATENT 723508. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Durchlassfilter für einen sehr grossen hochfrequensbereich (Band-pass filter for a very wide high-frequency band). Application T51394 VIIIa/21a4, Nov 1938. Original inventor: Weber. Aug 1942. 3 p.

PB 10990. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Einrichtung zur erzeugung eines auf einem kegelmantel rotierenden richtdiagramms. (An arrangement for producing a rotating cone shaped directional pattern). German patent application T60134 VIII a/21a4 applied for Feb 28, 1944 and still pending. Original inventor: Bermit. 1944. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Drawing missing.

GER. PATENT 730297. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Einrichtung zur fernbedienung einer einstellvorrichtung, insbesondere für das abstimmittel eines senders oder empfängers. (Arrangement for the remote control of a tuning device, especially for the tuning of a transmitter or receiver). Application T47915 VIIIa/21a4, Dec 1936. Original inventor: Schröder. Jan 1943. 4 p.

GER. PATENT 722192. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Einrichtung zur veränderlichen induktiven oder kapazitiven kopplung zweier hochfrequenzkreise. (Device for varying the inductive or capacitive coupling of two high-frequency circuits.) Application T52176 VIIIa/21a4, Oct 1936. Original inventor: Burghols. Jul 1942. 2 p.

PB 10997. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Einrichtung zur selbsttätigen bandbreiteregelung in empfängern. (Arrangement for automatic band-width control in receivers). German patent application T60178 VIII a/21a4 applied for Mar 2, 1944 and still pending. Original inventor: Wilke. An addition to German patent application T59782 VIII a/21a4, PB 9381. 1944. 4 p. Price: Microfilm-50¢ - Photostat-$1.00

GER. PATENT 733428. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Einrichtung zur selbsttätigen einstellung eines drehbaren systems. (Device for the automatic adjustment of a revolving system.) Application T51923, May 1939. Original inventors: Bergtold and others. Mar 1943. 6 p.

GER. PATENT 732670. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Einrichtung zur tastung einer hochfrequenzleitung. (Arrangement for keying a high-frequency line) Application T54452, VIIIa/21a4 Nov 1940. Original inventors: Schmid and others. Mar 1943. 2 p.

GER. PATENT 729111. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Einrichtung zur umwandlung einer frequenzmodulierten schwingung in eine amplitudenmodulierte schwingung. (Arrangement for the conversion of frequency modulated oscillations into amplitude modulated oscillations). Application T55066 VIIIa/21a4, Mar 1941. Original inventors: Bürck and others. Dec 1942. 5 p.

GER. PATENT 730351. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Einrichtung zur zusammenschaltung der beiden antennenspannungen im eingang eines zielkurssempfängers. (Arrangement for combining the two antenna voltages at the input stage of a homing receiver) Application T49263 VIIIa/21a4, Sep 1937. Original inventor: Wege. Jan 1943. 4 p.

PB 9042. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Elektrisches entladungsgefäss mit einer strebe aus metallblech. (An electric discharge tube with a sheet-metal support). German patent application T57113 VIII c/21g, Mar 20, 1942. Patent granted under No. 765989. Original inventor: Drescher. 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Illustrated.

PB 9041. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Entladungsröhre mit einer mittelbar geheizten kathode. (A discharge tube with indirectly heated cathode) German patent application T57115 VIII c/21g, Mar 20, 1942, still pending, being an addition to DRP (German Reichs Patent) 635542. Original inventor: Geiger. 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Illustrated.

GER. PATENT 727363. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Flimmerpeiler (Lobe switching direction finder). Application T53951 VIIIa/21a4, Jul 1940. Original inventors: Ulbricht, and others. Nov 1942. 3 p.
This patent pertains to an automatic-sense direction finder which incorporates an antenna switching device for obtaining optical and acoustical indicator signals.

GER. PATENT 719013. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Fremdgesteuerte verstärkerschaltung für ultrakurze wellen. (Externally excited amplifier circuit for ultra- short waves.) Application T44876 VIIIa/21a4, Jan 1935. Original inventor: Runge. Mar 1942. 4 p.

GER. PATENT 705236. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Für empfänger oder sender dienende einstellvorrichtung (Tuning-device for receivers or transmitters). Application T49746 VIIIa/21a4. Jan 1938. Original inventor: Mahnken. Apr 1941. 3 p.

GER. PATENT 731700. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Gerät zur ermittlung eines elektromagnetischen, ultrakurze wellen reflektierenden gegenstandes. (Equipment for the detection of an object which reflects ultra-short electromagnetic waves) Application T45206 VIIIa/21a4, Apr 1935. Feb 1943. 2 p.

PB 9006. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Goniometer. (A goniometer) German patent application T56968 VIII a/21a4, Mar 2, 1942, still pending. Original inventor: Reichardt. 1942. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
Illustrated.

PB 9005. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE, M.B.H., BERLIN. Goniometer für peilzwecke. (A goniometer for direction finding use) German patent application T56968 VIII a/21a4, Feb 26, 1942. Patent granted under No. 754633. Original inventor: Bihl. 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Illustrated.

GER. PATENT 724061. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Goniometer für zwei oder mehr wellenbereiche. (Goniometer for two or more wave bands. Application T52108 VIIIa/21a4, Apr 1939. Original inventors: Schulz and others. Aug 1942. 4 p.

GER. PATENT 727325. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Hochfrequenzspule mit ganz oder nahezu temperaturunabhängiger induktivität (High-frequency coil with an inductance which is perfectly or almost independent of temperature). Application T54580 VIIIa/21a4, Nov 1940. Original inventor: Lachnit. Oct 1942. 3 p.

GER. PATENT 723422. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Hochfrequenzzweipol-gleichrichterschaltung (High-frequency diode rectifier circuit). Application T54264 VIIIa/21a4, Sep 1940. Original inventor: Gollub. Aug 1942. 3 p.

GER. PATENT 733424. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. In oberwellen erregter hohlraumresonator. (Cavity resonator excited by harmonics) Application T53420, VIIIa/21a4 Feb 1940. Original inventor: Engbert. Mar 1943. 3 p.

PB 9043. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Induktives peilgoniometer. (An inductive goniometer for radio direction finding). German patent application T57104 VIII a/21a4, Mar 20, 1942. Patent granted under No. 761832. Original inventor: Fröling. 1942. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
Illustrated.

GER. PATENT 719172. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Kabel zur leitung sehr kurzer elektromagnetischer wellen. (Cable for the conduction of microwaves.) Application T46156 VIII a/21a4, Dec 1935. Original inventor: Krügel. Mar 1942. 3 p.

PB 10983. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Magnetfeldröhre für sehr kurze wellen mit einer in segmente unterteilten anode. (Magnetic field tube for very short waves with an anode split into segments). German patent application T60148 VIII c/21g applied for Feb 24, 1944 and still pending. Original inventor: Steimel. 1944. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
Drawing missing.

GER. PATENT 729112. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Peilanlage. (Direction finding installation) Application T48841 VIIIa/21a4, Jul 1937. Original inventor: Leib. Dec 1942. 4 p.

GER. PATENT 726744. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Peilanordnung zur nachteffektfreien richtungsbestimmung. (Direction finding arrangement which is free of night effect, for determining bearings.) Application T47680 VIIIa/21a4, Oct 1936. Original inventor: Hasselbeck. Oct 1942. 4 p.

GER. PATENT 730798. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Peilantennensystem. (Direction finder antenna system) Application T51513 VIIIa/21a4, Dec 1938. Original inventor: Bergtold. Jan 1943. 4p.

PB 9089. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Piezoelektrische schwing-kristall-anordnung. (Piezoelectric oscillator-crystal arrangement) German patent T57102 VIII a/21a4, Mar 20, 1942, still pending. Original inventors: Dr. Krause, Urtel. 1942. 9 p. Price: Microfilm-50¢ - Photostat-$1.00 Illustrated.

GER. PATENT 733162. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Projektionsskala mit mehreren teilungsarten für hoch-frequenzgeräte. (Projection-type dial card with several graduations for high-frequency equipments) Application T52366, VIIIa/21a4, Jun 1939. Original inventors: Jung and others. Mar 1943. 3 p.

PB 9044. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Schaltungsanordnung für einen verstärker, dessen frequenzbereich sich von der frequenz null bis zu einer sehr hohen wechselstromfrequenz erstreckt. (A circuit arrangement for an amplifier in which the frequency range extends from zero to a very high alternating-current frequency). German patent application T57105 VIII a/21a2, Mar 20, 1942, still pending. Original inventor: Schröder. 1942. 10 p. Price: Microfilm-50¢ - Photostat-$1.00 Illustrated. The frequency range of this amplifier is from zero cps to ten mc.

PB 10084. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Schaltungsanordnung zur vermeidung der zerstörung von senderöhren bei überschlagen. (Circuit arrangement to avoid the destruction of transmitting tubes due to arcing over). German patent application T60157 VIII a/21a4 applied for Feb 24, 1944 and still pending. Original inventors: Buschbeck, Prost. 1944. 6 p. Price: Microfilm-50¢ - Photostat-$1.00

GER. PATENT 726515. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Stabantenne für fahrzeuge (Whip antenna for vehicles). Application T50396 VIIIa/21a4, May 1938. Original inventor: Richter. Oct 1942. 3 p.

GER. PATENT 733160. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Variometer für hochfrequenz. (High-frequency variometer) Application T51001 VIIIa/21a4, Oct 8, 1938. Original inventor: Bergtold. Mar 1943. 3 p.

GER. PATENT 727026. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Variometer mit aussen auf den windungen und parallel zur achse der drehbaren spule verschiebbarem abgriff. (Variometer with a sliding contact outside the windings and parallel to the axis of the rotor.) Application T51345 VIIIa/21a4, Nov 1938. Original inventor: Richter. Oct 1942. 2 p.

GER. PATENT 722630. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Verfahren zur bestimmung von fahrtrichtung und geschwindigkeit eines sich in einer fahrstrasse bewegenden gegenstandes. (Method for determining the direction and speed of an object traveling along a road.) Application T50429 VIIIa/21a4, May 1938. Original inventor: Scharlau. Jul 1942. 3 p.

GER. PATENT 729019. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Verfahren zur modulation ultrakurzer wellen. (Method for the modulation of ultra-short waves). Application T45410 VIIIa/21a4, Jun 1935. Original inventor: Gerhard. Dec 1942. 3 p.

GER. PATENT 721600. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN-ZEHLENDORF. Vorrichtung zur erzeugung von schwingungen sehr hoher frequenz mit hilfe eines reihenvervielfachers. (Device for generating very high frequency oscillations by means of an electron multiplier.) Application T49262 VIIIa/21a4, Sep 1937. Original inventor: Forberger. Jun 1942. 3 p.

GER. PATENT 731236. ZEISS (CARL), JENA. In luft schwingender piezoelektrischer oszillator oder resonator. (A piezoelectric oscillator or resonator oscillating in air) Application Z20137 VIIIa/21a4, Apr 1932. Feb 1943. 2 p.

United States

PB 23702. BRILLOUIN, LEON. A coil yielding a single dipole moment. (OSRD Rept 4020; NDRC Applied Math Panel Rept 120. 1R; Columbia Univ Applied Math Group Rept 188). Jul 1944. 32 p. Price: Microfilm-50¢ - Photostat-$3.00
The problem involved in these calculations was how to wind a coil in such a way that the field outside of the coil should be almost exactly the magnetic field of a single dipole. The windings must be split in a certain number of small separate coils, each of which can be maintained in a fixed position. The report starts with a theoretical discussion of the multipole problem. Section 3 discusses more specifically the structures of spherical shape and Section 4 deals with the problem of the magnetic field produced by a coil. Section 5 discusses narrow coils. Section 7 contains the computations of the total flux through the collecting coils and the formulas for the ratios of the outer and inner coils. Systematic corrections and coil thickness correction are given. Mathematical tables and illustrations are included. See also PB 23703.

PB 23699. BRILLOUIN, LEON. Electronic theory of the cylindrical magnetron, static characteristics. (OSRD Rept 4742; NDRC Applied Math Panel Rept 129.2R; Columbia Univ Applied Math Group Rept 356). Feb 1945. 50 p. Price: Microfilm-50¢ - Photostat-$1.00
The aim of this report is to present a summary of the theory for cylindrical magnetrons operated under steady conditions. The theory is explained as briefly as possible and solutions of the general equation for "self-consistent trajectories" are obtained either by approximations or by numerical integration on the differential analyzer of the MIT. The field of integration has been extended beyond the limit of the first maximum. This continuation of the curves has no physical meaning in the steady case, but may be useful later for the discussion of oscillating magnetrons. Furthermore, these curves are very useful for a better understanding of the continuous distortion of magnetron characteristics when the anode radius is increased. The static characteristic of a magnetron is the most important information to be obtained from the theory, since it represents the practical summary needed by technicians. This is discussed in this report and some important results are obtained. References are included, and equations are developed in the report. A series of curves is appended.

OSRD 4510

PB 23700. BRILLOUIN, LEON. Electronic theory of the plane magnetron. (NDRC Applied Math Panel Rept 129.1R; Columbia Univ Applied Math Group Rept 229). 69 p. Price: Microfilm-$1.00 - Photostat-$5.00
This report summarizes personal research of the author and results obtained in British reports up to 1943. It proves that the normal state of a steady magnetron is the "single stream" motion. Curves are included.

PB 24882. ELLIS, L. G. and others. The location of nonmetallic land mines by the use of vibrational devices. (OSRD Rept 3090). Feb 1944. 70 p. Price: Microfilm-$1.00 - Photostat-$5.00

The investigations of the seismic methods of locating nonmetallic land mines have been carried out along two lines. One of these, the resonant method, was initiated as a consequence of observations made in connection with seismic petroleum exploration, and particularly studies of the resonant characteristics of a detector. The other line of investigation involved the use of seismic diffraction waves in a manner similar to their use in seismic petroleum exploration, except on a much smaller scale. Procedure and results of studies of these methods and instruments developed are presented in this report from the Geophysical Laboratory, Sun Oil Company. It was found that the diffraction method was not as satisfactory as the resonant method. Photographs, schematic diagrams, outline drawings, tables, and graphs are included.

PB 24880. NYJEN, HAAKON M. and MILLS, W. V. Detection of small foreign bodies imbedded in the top soil by low frequency alternating currents. Final report. (OSRD Rept 5677). Sep 1945. 31 p. Price: Microfilm-50¢ - Photostat-$3.00
The purpose of the work undertaken with The Miflex Company, and covered by this report, was to investigate the possibility of locating nonmetallic land mines such as plastic mines, through their resistivity characteristics. It was a purpose also of this work to employ a method in which current would be fed into the ground independent of the pick-up units, thus avoiding dangers arising from enemy countermeasures against radiating detectors. It was specified in this work that the detector heads must not radiate energy. The problem of detection of sub-audible frequencies by portable instruments with sufficient precision required the development of a new technique, which is described. Photographs and schematic diagrams are included. Two types of detector heads were developed: (1) A so-called potential differentiator requiring physical contact with the ground, (2) a flux differentiator, not requiring physical contact. The first was demonstrated to be practical. Experiments were not completed on the second.

PB 22738. EWING, MAURICE and WORZEL, J. LAMAR. Long-range sound transmission: Interim report no. 1, March 1, 1944-January 20, 1945. (Woods Hole Oceanographic Institution Rept 9). Aug 1945. 78 p. Price: Microfilm-$1.00 - Photostat-$6.00
Experiments are described to demonstrate a new method of sonic signalling at extremely long ranges in the oceans, utilizing the natural sound channel. Signals were made by causing a four pound charge of TNT to explode at about 4000 feet depth. The signals were received at distances up to 900 miles. Two receiving arrangements have been used, a hydrophone hung 4000 feet over the side of a ship which was hove to, and a shore connected hydrophone which lay on bottom 4000 feet deep. Extrapolation of the results indicate a range of at least 10,000 miles from this size charge. Recommendation is made to utilize a network of monitoring stations to locate planes, ships, and life rafts in distress on the open oceans. Three or more stations receiving a signal could locate the source at better than one mile. Graphs and diagrams illustrate the report. The work was done under contract for the Navy Department, Bureau of Ships.

PB 24869. FARNSWORTH, H. E. Cathode ray tube detectors. Final report. (NDRC Rept 14-376). Jan 1944. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a summary report of investigation on magnetic cathode ray tubes. Included are results of studies of the defocusing problem, field measurements, oscillations on the sweep line, and the determination of the angle between the magnetic and geometric axes of a focus coil. The work was carried on at Brown University.

PB 24872. GODET, S. Two motor-driven gun turrets. Final technical report. (NDRC Rept 14-230). Dec 1943. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
The General Electric Company, under a contract with the National Defense Research Committee, adapted two aircraft machine-gun turrets with amplidyne controls for use as parabola mounts in radar tracking studies. The first unit was shipped to the Radiation Laboratory of the Massachusetts Institute of Technology on May 26, 1941 and installed on a roof, with controls for both manual and automatic tracking. The second was installed in the Radiation Laboratory XT-1 mobile radar unit. It provided three types of control: Manual by external handsight, manual by handwheels inside the truck with pip matching, and automatic by the radar signal. Automatic following was accomplished on the XT-1 on November 4, 1941. This development led to the four XT-1A models manufactured by General Electric for the National Defense Research Council and the Signal Corps and finally to the SCR-584 AA fire-control radar. A brief summary of the adaptation of these turrets to this use, together with numerous photographs and tabulated data, is included.

PB 20294. HANDELMAN, G. H. and others. Forced vibrations of a simple oscillator with limited displacement. (OSRD Rept 3031; NDRC Applied Math Panel Rept 36.4; Brown Univ Applied Math Group Rept 4) Dec 1943. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
A graphical representation of the motion of the mechanical system shown in an illustration is discussed in this report. The system consists of a mass attached to a spring of linear elasticity; the motion of the mass is limited on one side by a stop. Vibrations are set up by impressing a periodic square wave displacement on one end of the spring. The amplitude of the driving motion is taken as the unit of length and the period of the free vibration of the oscillator is taken as the unit of time. Between impacts and changes in the position of the driven end of the spring, the elongation follows the harmonic law for which an equation is given. This can be represented graphically in a simple manner due to H. Meissner and based on the fact that the abscissa of a point fixed in the plane with respect to a system of coordinates rotating about the origin with an angular velocity of 2 π radians per unit time will be given by the equation. The ordinate of the point will represent the reduced velocity defined as the actual velocity divided by 2 π. The effect of an impact or the driving motion is taken care of by a suitable shift in the position of the representative point. This is described more completely in section 3, and in section 4 an analysis of a general motion is carried out. Periodic motions present certain simplifications. In section 4 a case in which there are two possible periodic solutions for the given set of physical parameters is considered. By examining the behavior of motions which start with a representative point near that corresponding to the periodic solutions, it has been found that one of the two periodic motions is stable whereas the other is unstable. A motion starting in the neighborhood of the unstable solution has been found to settle down practically to the stable periodic solution after about 17 cycles, thus offering some evidence in support of the opinion that all solutions will eventually approach a stable periodic one. It must be noted that the present method does not give a complete discussion of the stability problem. It does, however, offer a simple, rapid procedure for determining whether a given set of physical parameters is stable or not, and for studying the motion developing from a given, arbitrary set of initial conditions. Eleven drawings are included.

PB 22785. IDE, JOHN M. and others. Report on the propagation of underwater sound at low frequencies as a function of the acoustic properties of the bottom. (Naval Res Lab Rept S-2113). Aug 1943. 177 p. Price: Microfilm-$2.00 - Photostat-$12.00
This report presents an experimental and theoretical analysis of the transmission of underwater sound in shallow water, taking into account the influence of the bottom. The analysis is particularly concerned with frequencies at which the wave lengths are comparable to the physical dimensions of the acoustic system. The examination of 96 range run records from two locations in the Potomac River area shows, within the frequency range 70-400 cps, different rates of attenuation of sound pressure level with distance, depending upon the acoustic properties of the bottom. The records indicate a low rate of attenuation over hard bottom. It is concluded that the impedance is insufficient to determine the general propagation constants required for solving transmission problems. A new analysis of underwater sound propagation is

given in terms of the normal modes of vibration of the acoustic system of the sea between surface and bottom. The experimental results are interpreted successfully and in detail in terms of the initial stimulation, the relative attenuation, and the phase velocities of the modes. Methods are described for specifying the character of the transmission and computing the propagation constants, when the density and the velocity of sound of the bottom material are known. The use of acoustic measurements as transmission criteria is discussed, together with the estimation of acoustic constants from hydrophone soundings, bottom samples, and hydrographic data. Computation of transmission characteristics from the data is facilitated by the use of six charts which are reproduced in the report. Applications of the analysis to problems of specific interest to the Navy are discussed.

PB 24867. LORANCE, G. T. Scanning antenna for the eagle precision radar bombsight (AN/APQ-7). Final report. (NDRC Rept 14-312). Aug 1944. 38 p. Price: Microfilm-50¢ - Photostat-$3.00
The project covered by this report called for the design and construction of one 5' model the "Egg Beater" antenna by the International Projector Corporation. Prints of drawings which were prepared and apply to the model make up this report. Development work was done by the Radiation Laboratory, M.I.T.

PB 23340. MADDOCK, B. H. Development of a high impedance radio frequency transmission line. (NDRD Rept 14-434) Jan 1945. 23 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes the work done by the Federal Telephone and Radio Corporation at the request of the Radiation Laboratory, Massachusetts Institute of Technology in designing and manufacturing a special coaxial transmission line having a characteristic impedance on the order of 1000 ohms. The problem consisted chiefly in the development of manufacturing techniques and equipments for winding small size enamelled wire in a close spiral on a non-conducting (polyethylene) core, extrusion of a polyethylene over this spiral conductor and the development of methods and equipments suitable for the measurement of the electrical characteristics (time delay, characteristic impedance and attenuation) of the completed transmission line on a production basis. Manufacturing equipments and testing facilities were developed and made available for the production of approximately 75,000 feet per month of a special 950 ohm radio frequency transmission line known as Army-Navy type RG-65/U. The appendix to the report contains the following supplementary material: Letters from Radiation Laboratory, Massachusetts Institute of Technology and the Bureau of Ships concerning development of the cable and replies to these letters; the Army-Navy specification for RG-65/U cable; diagram, and photographs.

PB 23329. MARSHALL, J. P. and others. Supersonic Loran trainer. (NDRC Rept 14-446). Jun 1945. 79 p. Price: Microfilm-$1.00 - Photostat-$6.00
This is a report on work done at the Bartol Research Foundation of the Franklin Institute, Swarthmore, Pa., between June 30, 1944 and February 28, 1945. The introduction is by W.F.G. Swann, Official Investigator: Section I presents the general trainer problem: To construct a trainer which would duplicate actual flight conditions. Section II discusses the research and development leading up to the design of the Rochelle salt transducers used in the Trainer. Section III discusses the research associated with the electronic circuits incorporated in the Trainer. Section IV is a general description of the completed trainer. It is in two pair units, i.e. three transmitters and one receiver with associated electronic equipment, built on a table eight feet square. Photographs, drawings, circuit and block diagrams illustrate the report.

PB 24879. RAZEK, JOSEPH. Investigation of a method of nonmagnetic mine detection based on the "well-logger". (OSRD Rept 4237). Oct 1944. 21 p. Price: Microfilm-50¢ - Photostat-$2.00
An attempt has been made to develop a detector for nonmetallic mines by employing oscillators operating in the range of 7 and 28 megacycles. Such oscillators have been successfully used to determine geological data in drilled wells since they permit measuring certain physical characteristics such as the resistivity of the soil. It was hoped that this device, normally termed the "Well-logger", might be able to detect a disturbance in the ground caused by the presence of a buried mine. However, it was found that the "Well-logger" could not solve the problem. Photographs, tables and schematic diagrams are included.

PB 24878. RAZEK, JOSEPH. Report on mine detection method proposed by Virgil Brittain. Final report. (OSRD Rept 4238). Oct 1944. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
The method outlined by Virgil Brittain for detecting plastic mines is based upon the assumption that the magnetic field associated with a low frequency oscillator coil will be sufficiently affected by surrounding material, such as soil or sand, to cause a noticeable frequency shift. Careful experiments have been conducted but the results obtained were negative. Procedures and findings of tests are described. Photographs of dual oscillator and blueprint of circuit used for the testing are included.

PB 23847. KIMSEY, V. H. and others. On the design of minimum-beam width broad band slotted antenna arrays with suppressed side lobes. n. d. 57 p. Price: Microfilm-$1.00 - Photostat-$4.00
A new type of broadside array for vertical polarization is described. Its novel features include a broad banded slot type primary radiator, a new current distribution designed for low side lobe level and minimum beam width, a compact network capable of furnishing a wide variety of power distributions, and an overall mechanical design embodying extreme lightness, mechanical rigidity, small wind resistance, with sectionalization for ease in transportation. Several convenient techniques for measuring the performance of the antenna and feed system are also described. Photographs, drawings and graphs are included in this report from the Naval Research Laboratory.

PB 22784. SAXTON, H. L. and SMITH, P. L. Report on the reflection of a sound pulse normally incident in a liquid medium upon a plane solid plate. (Naval Res Lab Rept S-3076). May 1943. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
The reflection of plane wave sound pulses normally incident in a liquid medium upon a plane solid nondissipative plate backed by a medium of negligible elasticity is theoretically analyzed. A general solution of the problem is obtained by resolving the incident pulse into its steady state components and recombining them after reflection for the reflected pulse. Certain special cases, such as the rectangular pulse and the damped sine pulse, are given special consideration. Curves illustrate the pulse behavior.

PB 22914. STEVENS, S. S. and others. An electronic device to simulate atmospheric static. (NDRC Rec on Sound Control Informal Communication 75). May 1944. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This report contains a description and photographs of the static generator, type 100S, one of several circuits developed for the purpose of generating a noise similar in character to that produced in a radio receiver as a result of electrical charges in the atmosphere. It is used in testing communication equipment, in training communication operators, and to simulate the din of battle when amplified by loudspeakers. As a function of frequency, the output of the generator is essentially flat from at least 50 to 10,000 cps. Oscillograms of synthetic static and a circuit diagram of generator are included. The work was carried on at the Psycho-Acoustic Laboratory, Harvard University.

PB 22128. U.S. ARMY. FORCES IN THE PACIFIC. ANALYSIS SECTION. Ordnance unidentified cathode ray gun assembly. (Rept 9). Mar 1946. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
A description is given of an unidentified apparatus found in a Tokyo arsenal. The only component recovered of this cathode ray gun assembly dealt with focusing and deflection. Photographs are appended.

PB 24913. U.S. BUREAU OF SHIPS. Advance instruction literature for operation and maintenance of Navy model SC-3 radar equipment. (Manufactured by General Electric Co., Schenectady, N.Y.). (SHIPS 221). Nov 1943. 105 p. Price: Microfilm-$1.50 - Photostat-$7.00
Instructions are given for the operation and adjustment, maintenance, servicing and trouble shooting of the SC-3 type radar equipment. These include the transmitter, control unit, receiver-indicator, dehydrating equipment, duplexing unit, plan position indicator and their component parts. The utilization of the A scope and the P scope for searching are explained. Sketches, diagrams, charts and tables are included.

PB 24920. U.S. BUREAU OF SHIPS. Handbook of maintenance instructions for radio set AN/CPN-3. (Manufactured by Philco Corp., Philadelphia). (SHIPS 287). Aug 1944. 334 p. Price: Microfilm-$3.50 - Photostat-$23.00
Subject set is a ground radar beacon which responds automatically to beacon interrogating pulses from radar equipment on aircraft seeking the beacon position. The radio set is nondirectional, receiving over a wide super-high frequency band, and transmitting at a preset frequency near this band. The response band of the receiver is 66 megacycles wide, extending from 3267 to 3333 megacycles. The frequency of the transmitter remains fixed at 3256 megacycles. Description of the set is followed by instructions for the installation and adjustment, operation and maintenance of the equipment. Supplementary data comprise an American-British glossary, and information on test equipment, transmitter power output measurement, multivibrator principles, theories of the reflex klystron and of the magnetron, differentiating and integrating circuits, specifications, and moisture and fungus proofing. A parts catalog, tables, photographs, outline drawings and schematic diagrams are included.

PB 24912. U.S. BUREAU OF SHIPS. Instruction book for detector amplifier assembly, model AN/UPA-1. (Manufactured by Belmont Radio Corporation, Chicago, Ill.). (SHIPS 271 (A)). Jun 1945. 39 p. Price: Microfilm-50¢ - Photostat-$3.00
This equipment is intended for use with the oscilloscope section of Synchroscope TS-28/UPN, though it can be used with ordinary oscilloscopes. By its use, frequencies, including short r-f pulses, can be detected and then amplified for viewing on the oscilloscope screen. This signal is first detected, producing a wave form which corresponds to the variations in the r-f amplitude of the signal voltage. This wave form follows the peaks of the signal and may be looked upon as an "envelope". The equipment consists of a four-stage video amplifier which rectifies and amplifies without detecting frequencies above 6 mc., amplifying the resultant "envelope" representing modulating frequencies from 100 cps. to 6 mc. The power supply is 105/125 volts, 50/70 cps., 53.5 watts at 117.5 volts. Following the general description and theory of operation of the equipment and its parts are instructions for the operation, adjustment, and maintenance of the equipment and its components. Photographs, charts, tables, schematic and wiring diagrams and parts lists are included.

PB 24923. U.S. BUREAU OF SHIPS. Instruction book for model DAU high frequency radio direction finder equipment. (Manufactured by Federal Telephone and Radio Corporation, Newark, N. J.). (SHIPS 301). Sep 1944. 212 p. Price: Microfilm$2.50 - Photostat-$15.00
The model DAU equipment is a shipboard radio direction finder which provides instantaneous visual indications of the bearings of received signals in the frequency range of 1.5 to 22 megacycles through the use of a scanner, a cathode-ray tube and a motor driven goniometer. The scanner permits the operator to see a bandwidth of 75 kilocycles on either side of the frequency to which the receiver is tuned. Description of the equipment and fundamentals of direction finding are followed by instructions for the installation, calibration, operation, adjustment and maintenance of the equipment. Parts lists, color code, and supplementary data on CFT-52300 target transmitter with outline drawings are included. There are also photographs, drawings, diagrams and graphs.

PB 24914. U.S. BUREAU OF SHIPS. Instruction book for model SJ radar equipment. (Manufactured by Western Electric Co. Inc., New York, N.Y.). (ENG 188). Feb 1941. 441 p. Price: Microfilm-$4.50 - Photostat-$30.00
This equipment is a radio detection and ranging equipment designed for use on submarines to detect the presence of surface objects such as ships or submarines, and to indicate the distance and direction of such objects. It is divided into four sections; the antenna assembly, the transmitting and receiving, the indicating, and the control and power equipments. Frequency range is not given, though 3000 mc. is used in the manual for representing an operational frequency in the microwave band. It is designed to operate from a 120 volt, single phase, 60 cycle a-c power source. Descriptions of the units and their components are followed by instructions for the installation, operation, maintenance and repair of the units and components. A list of vacuum tubes used is given with descriptions and diagrams. Assembly drawings, photographs, diagrams, charts and parts lists are included. The appendix gives a brief description of multivibrator operation with diagrams.

PB 24937. U.S. BUREAU OF SHIPS. Instruction book for Navy model SA-1 radar equipment. (Manufactured by RCA Victor Division of Radio Corporation of America, Camden, N.J.). (Instruction Book 38187; SHIPS 211). Jan-Jun 1942. 272 p. Price: Microfilm-$3.00 - Photostat-$19.00
This radar equipment is designed for shipboard installation. It consists of a radar transmitter, a receiver-indicator, a rotatable antenna and a train indicator-control unit. The equipment is used for determining the bearing and range of remote aerial, land and naval objects. The units with the exception of the antennas are self-contained in cabinet type enclosures. The transmitter operates at a frequency of 200 ± 25 megacycles. Four general bands are employed. A description of the units and their components is followed by instructions for the installation, adjustment, operation and maintenance of the equipment and its components. Photographs, oscillograms, curves, block, schematic and connection diagrams, charts, assembly drawings and parts lists are included.

PB 24938. U.S. BUREAU OF SHIPS. Preliminary instruction book for Navy model SA-3 radar equipment. (Manufactured by RCA Victor Division of Radio Corporation of America, Camden, N.J.). (Instruction Book 38332-P1; SHIPS 263). Sep 1943. 496 p. Price: Microfilm-$5.00 - Photostat-$34.00
This radar equipment is designed for shipboard installation. It permits the detection of remote objects and accurately determines their bearings and range. Radar information is obtained on the screens of two cathode-ray indicator tubes. One is a modified type "A" oscilloscope which allows accurate orientation of the antenna in the direction of the target and determination of the target range. The other tube is a plain position indicator, which allows the detection from the mere inspection of its screen, of aerial, marine and land objects present within a given sector of the compass, and the determination of the distance and range of such objects. The transmitter and receiver are designed to operate at any given frequency between 175 and 225 megacycles per second. The equipment is energized from a 115 volt 60-cycle single phase a-c power supply. An account of the general operating features of the radar system is followed by the list of major components and their parts, with a full description of each. Instructions are given for the installation, adjustment, maintenance and servicing of the equipment and its components. Photographs, block, schematic and connection diagrams, charts, assembly drawings, oscillograms and parts lists are included.

PB 24021. U.S. BUREAU OF SHIPS. Preliminary instruction book for Naval model VD/VD-1 plan position indicator repeater. (Manufactured by Raytheon Manufacturing Company, Waltham, Mass.) (SHIPS 230). n.d. 92 p. Price: Microfilm-$1.00 - Photostat-$7.00
Plan position indicator repeaters, Navy model VD (type CRP-55AEE) and Navy model VD-1 (type CRP-55AEH) are auxiliary units designed for use with various types of radar equipment. Their function is to repeat at a remote point the range and bearing information provided by the master PPI. This information is reproduced on a seven-inch cathode-ray tube having electromagnetic deflection and a long-persistence screen. Description of the units is followed by instructions for the installation, operation, maintenance and service of the equipment. Tables, photographs and schematic diagrams are included.

PB 23669. U. S. WAR DEPARTMENT. Antenna kit for rhombic receiving antenna (drawing RS-B-386-E), and supplement, dated Jun 1, 1945. (Tech Manual 11-2611) Apr. 1944. 63 p. Price: Microfilm-$1.00 - Photostat-$5.00
These specifications cover the construction of a one wire rhombic receiving antenna, and include specification tables and detailed drawings. A supplement contains corrected drawings and text.

PB 22023. U.S. WAR DEPARTMENT. Antenna position controls MC-298-A and MC-298-B, conversion kits for radio sets SCR-270- ( ) and SCR-271-( ). (Tech Manual 11-1089). Aug 1943. 193 p. Price: Microfilm-$2.00 - Photostat-$13.00
This manual, replete with diagrams, photographs and tables, describes the electrical and mechanical installation of Antenna Position Control MC-298 which replaces the magnetic clutch drive motor system now in use on SCR-270 and SCR-271 radar equipment. Three general types of antenna control are provided by this Antenna Position Control MC-298: Position control, rate control, and automatic sector sweep. Instructions are given for the installation, operation, adjustment, and maintenance of the equipment.

PB 23444. U. S. WAR DEPARTMENT. Radio set AN/TPS-3, preventive maintenance. (Tech Manual 11-1440) Mar 1944. 60 p. Available from the Supt Docs, Washington 25, D. C. 20¢
This manual describes the preventive maintenance procedures that are to be applied to AN/TPS-3 radar equipment. Information is given on general preventive maintenance, handling of service tools supplied with the set, maintenance techniques, and maintenance items. Photographs, diagrams and sample schedule sheets are included.

PB 23657. U. S. WAR DEPARTMENT. Range calibrator I-223-A. (Tech Manual 11-2628) Nov 1944. 45 p. Price: Microfilm-50¢ - Photostat-$3.00
Range Calibrator I-223-A, used to provide means for checking and adjusting the range measuring circuits of a pulse-operated radar apparatus, produces three outputs: A sine-wave output at 163.94 kc., a synchronizing pulse with a repetition rate of about 240 pulses per second, and positive pulses having pulse width of not more than one microsecond and a repetition rate of 163.940 times per second. Range Calibrator I-223-A has been designed to operate from a 117.5 volt, 60-cycle line. Its power consumption is 40 watts. This manual contains instructions for its operation and maintenance, with a maintenance parts list and diagrams and photographs.

PB 15247. U. S. WAR DEPARTMENT. SIGNAL CORPS. DETROIT SIGNAL LABORATORY. Radio-interference suppression as applied to experimental pilot-model engines, models ZZ, ZZP, and ZZB-6, manufactured by Briggs and Stratton Corporation, Milwaukee, Wisconsin. (Engineering Memo D 292-M-P-45) Mar 29, 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This document includes a diagrammatic summary of suppression application and eight blueprints illustrating suppression applied to the engine (with two additional blueprints showing minute details), suppression applied to spark plug and high-tension lead, shielding, bond strap, typical tooth-type-lockwasher applications, and typical bond strap application.

PB 24874. WEBER, ERNST. Junction effect of two unequal matched coaxial lines. Revised edition. (Polytechnic Institute of Brooklyn Rept PIB -1A). Sep 1942. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
From a solution of the electromagnetic field distribution, expressions are found for the equivalent capacitive susceptance appearing when two coaxial lines of equal impedance but unequal mechanical dimensions are joined. Curves are given with numerical values for 75 ohm coaxial lines. Measurements check well with the computed values, at least for not too severe discontinuities. This revised edition differs from the original edition in several respects, in addition to correcting some misprints.

PB 23322. WEISZ, PAUL B. and others. Apparatus for the transformation of rectangular coordinates using Arma-resolvers. (NDRC Rept 14-293). Jul 1944. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
The design of an apparatus for the electrical transformation of rectangular coordinates for all three angles of rotation is discussed. The apparatus makes use of three Arma-Resolvers in a direct-coupled arrangement, with primaries at resonance for the operating frequency. Means of phase and voltage adjustment between stages are discussed, and a number of performance tests described. Graphs and a circuit diagram are included. This was the Bartol Research Foundation of the Franklin Institute, Swarthmore, Pa.

PB 20145. YATES, KENNETH P. A continuous-wave method of measuring radar cross-sections and reflection patterns by means of models. (NDRC Rept 15-769-33). Oct 1945. 63 p. Price: Microfilm-$1.00 - Photostat-$5.00
This report gives a description of a method of measuring the radar cross-sections and the reflection patterns of various-shaped objects in the microwave region of the electromagnetic spectrum by means of models. Some of the reflection patterns of simple geometrical shapes, and of models of airplanes, counter-measure targets, and missiles obtained by this method are included in the report. A bibliography, diagrams and charts are attached.

PB 22406. YOUNG, L. C. and PAGE, R. M. Radio ranging and aircraft detection. Jun 1937. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
The report contains a description of radio ranging and aircraft detection equipment developed by physicists of Naval Research Laboratory in connection with patent applications for the equipment. This is one of the earliest developments of pulse-echo ranging equipment. A schematic circuit diagram is included.

Generators, Motors, Transmission, Distribution and Allied Equipment

German

GER. PATENT 722613. ALLGEMEINE ELEKTRIZITÄTS-GESELLSCHAFT, BERLIN. Verfahren zur abstimmung von hochfrequenzsperren (Method for tuning high-frequency blocking condensers). Application A87660 VIIIa/21a4, Aug 1938. Original inventor: Schulz. Jul 1942. 3 p.

PB 9036. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Aus einem ein- oder zweizylinder-motor und einem wechselstromgenerator bestehendes aggregat, insbesondere zur speisung von geräten der fernmeldetechnik. (An aggregate, consisting of a one or two cylinder engine and an alternating current generator, especially for supplying power to communication equipment). German patent application T57126 Ia/46c^3, Mar 17, 1942, still pending. Original inventor: Bahndorf. 1942. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
Illustrated.

United States

PB 23490. U.S. WAR DEPARTMENT. Power unit PE-201-A. (Tech Manual 11-914). Feb 25, 1943. 41 p. Price: Microscope-50¢ - Photostat-$3.00
This is an a-c, d-c generator, belt driven by a single cylinder, 4-cycle, air-cooled gasoline engine developing 2.75 h.p. at 2400 r.p.m. The generator, driven at a speed of 1800 r.p.m. by means of dual "V" belts develops 1000 watts, single phase, 115 volt alternating current, or 300 watts at 14.6 volt direct current. The unit is mounted on a welded pipe frame and generator base, which is provided with adjusting screws to permit adjustment of the tension of the drive belts. Following the description are instructions for the installation, preparation for use, maintenance and repair of the unit and its components. Photographs, diagrams assembly drawings and parts lists are included.

PB 23493. U.S. WAR DEPARTMENT. Power unit PE-245-A. (Tech Manual 11-930). Jun 6, 1944. 208 p. Price: Microfilm-$2.50 - Photostat-$14.00
This unit is a complete Diesel-engine-driven electric generating set designed to generate alternating current of 25 kw. capacity, 120/208 volts, 3 phase, 60 cycle at 1,200 revolutions per minute. The engine is a Cummins Diesel, Model HI-6, six cylinder, 4 7/8-inch bore and 6-inch stroke. The generator is directly connected to the engine through a flexible coupling of the stainless steel disc type. Following a description of the unit and its components, this comprehensive handbook presents instructions for the installation, operation, maintenance and repair of the unit and its components. Photographs, charts, schematic and wiring diagrams, assembly drawings and parts lists are included.

Miscellaneous

German

PB 19917. KONGSTED, L. P. Technical inspection of German industrial and manufacturing plants: Robert Bosch Co. dispersal sites. (Strategic Air Forces in Europe. Tech Intelligence Rept P-13) May 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
The plants inspected were: Elser Zweifel Co. at Bompflingen, Ulrich Gminder G.m.b.H. at Reutlingen, Schirm Co. at Kirchentellinsfurt, and Suls-Bundweberei at Suls, all being former textile factories converted to the manufacturing of electrical equipment such as: commutators, gasoline supply pumps for aircrafts, automotive and airplane switches, electric selenoids, voltage regulators, magnetos and coils. The visit to each plant and its manufacturing facilities is described in this report. (The report will not reproduce very well).

PB 22653. POOLE, ALFRED J. Electronic ignition. (FIAT Final Rept 635) Dec 1945. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
An electronic ignition system was produced experimentally by Bosch in Reichenbach, Germany, during the latter part of the war. It is claimed that this system eliminates many of the deficiencies of a conventional magneto system. Basically the circuit involved a condenser serving as an accumulator and charged through a resistance and discharged through the grid controlled tube to the primary of the high tension coil at the spark plug. After completion of the discharge, the grid voltage prevents further passage of current between the anode and cathode of the tube and the condensor charge is again built up. Gas filled tubes with heated electrodes proved better than those unheated electrodes, or high vacuum discharge types. Diagrams are included.

United States

OSRD 4351

PB 23703. BRILLOUIN, LEON. On spherical coils. (NDRC Applied Math Panel Memo 120.1M; Columbia Univ Applied Math Group Rept 288). Oct 1944. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
This report supplements the author's "A coil yielding a single dipole moment". (See PB 23702.) It discusses an alternative method presented by Dr. S. A. Schelkunoff of the Bell Telephone Laboratories in his "Mutual inductance between two spherical coils" and shows by a table that the two analyses yield identically the same formula despite some apparent discrepancies. A combination of the two methods disposes of the problem of the seventh and ninth dipoles which had caused perturbation.

PB 22899. MIKHALAPOV, G. S. and HUMBERSTONE, J. H. Survey of activity relative to the application of large diameter austenitic electrodes to the welding of armor. Advisory report. (OSRD Rept 1657; War Metallurgy Committee Rept M-109) Jul 1943. 26 p. Price: Microfilm-50¢ - Photostat-$2.00
This survey was initiated as a result of a request made by the General Motors Armor plate welding sub-committee for War Metallurgy Committee to consider an investigation of the application of large diameter austenitic electrodes in the fabrication of armored vehicles. The term "large diameter electrodes" applies specifically to the 3/8 in. and 1/2 in. diameters. Although the Ordnance Department had agreed to their use by certain fabricators on the basis of results obtained on 1½ in. H. plates, some of the members of the committee felt that the ballistic integrity of production vehicles might be adversely affected. It appeared logical to survey past and present activity as a preliminary to the actual initiation of a specific project of this nature. This report consists of a discussion of the results of the survey, along with recommendations concerning specific problems that need investigation. More data are needed before conclusive evidence in favor of large diameter electrodes is presented. The report contains thirteen welding tables.

PB 23694. STIBITZ, GEORGE R. A talk on relay computers. (NDRC Applied Math Panel Memo 171.1M). Mar 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This "Talk on Relay Computers" was given at Brown University on Feb 16, 1945. Relay computers are playing an increasing part in certain problems of applied mathematics. Continuous computers are mechanizations of geometry, while the discrete, or digital, computers are mechanizations of the number theory. The relay computer is a digital machine, in which numbers are represented by discrete physical situations. Each digit is represented by the state of a group of "relays". A relay is an electrically operated switch which closes when the coil of the relay is energized, and opens when the coil is de-energized. The relay, in turn, can be arranged to open or close one or more other electrical paths. The utility of the relay as a computing element lies in the fact that the contacts of several relays can be connected in series or in parallel, so that circuits through them satisfy the laws of logical addition and multiplication. In fact, the Boolean algebra has been applied successfully to deal with relay circuits. This talk gives the broad outline followed in the design of the general purpose relay computer and some of the details involved in handling numerical data.

FOOD AND KINDRED PRODUCTS

Danish

PB 25671. MARKLEY, K. S. Report on Denmark - fats, oils and oilseeds, Dansk Sojakagefabrik Akts., Copenhagen, Denmark. Aug 1945. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
The Dansk Sojakagefabrik, oil mill is one of the largest in Denmark. The other large oil mill is owned by the Aarhus Oliefabrik Akts at Aarhus. There are three smaller oil mills, a Lever Brothers Soap Works, and several margarine plants. The

oil mills have a capacity far in excess of the country's consuming power for fats, and hence Denmark exports both butter and vegetable fats and oils. Production and consumption figures of butter and margarine. The Danish Soyacake Factory, solvent extraction plants, refineries and dock and storage facilities are described. Hydrogenation, hydrogen and chlorine production and other processes are described. Prior to the war they processed soy beans, copra, peanuts, sesame, linseed and cottonseed; and refined palm kernel oil and fish and whale oil. They produced protein cake, and meal; crude and refined oils corresponding to the above, hardened oils, lecithin, distilled fatty acids, glycerine, caustic soda, hydrogen oxygen, soap and margarine.

Dutch

PB 25669. MARKLEY, K. S. Report on The Netherlands - fats, oils and oilseeds, Gonda Kaarsen Fabriek, Gonda, The Netherlands. Aug 1945. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report gives a brief history of this establishment which started as a candle factory around 1854. From candle making it branched out to include stearin and olein production for other purposes, particularly olein for sulfonation for textile assistants; and subsequently the production of fatty acids. Raw materials used are palm oil, bone grease, rendered animal fats from diseased cattle, and imported tallows. The processes of fatty acid distillation and pressing are described.

PB 25670. MARKLEY, K. S. Report on The Netherlands - fats, oils and oilseeds, Van den Bergh's en Jurgen's Fabrieken N.V (Margarine Union, Lever Bros. and Unilever Ltd) Rotterdam, The Netherlands. Aug 1945. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
This plant is the largest margarine factory in Holland, and produces approximately 80 percent of the margarine consumed in the country. Of the remainder, 10 percent is produced by two independent factories, and another 10 percent by about 12 other companies most of whom repack margarine made by the Van den Bergh's en Jurgens' Fabricken. The company was formed in 1928 by merger of the Van den Bergh and Jurgens' Companies; and in turn merged with the Hartog and George Schicht A.G. Aussig to form the Margarine Union in 1929, and subsequently with Lever Bros. and Unilever, Ltd. There are descriptions of the refinery and margarine plants, and of the processes used.

PB 25672. MARKLEY, K. S. Report on The Netherlands - fats, oils and oilseeds, Vereenigde Oliefabriek, Zwijndrecht, The Netherlands. Jul 1945. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
The mergers which led to the control of the margarine industry on the Continent by Lever Brothers & Unilever Ltd., are discussed. The report is divided as follows: I. Ownership of plant; II. processing capacity and raw materials handled; III. continuous solvent extraction plant; IV. batch extraction plant; V. press plant; VI. refining; VII. hydrogenation; VIII. laboratory. Machinery and processing in each plant are described. Prior to the war this plant, like the one at Raasrode, handled a wide variety of oleaginous materials including copra, palm kernels, soybeans, sesame, peanuts, and during the war rapeseed. At the time of the investigation they had on hand 6,000 tons of soybeans from the U.S. and expected some palm kernels.

German

PB 25634. BAILS, A. K. Mold growth from spent sulphite liquor at Zellwollewerke, Lensing. (FIAT Final Rept 521) Jan 1945. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
The plant was investigated regarding its process for using the mold, Oidium lactis in spent sulfite liquor for protein production. The product was sold chiefly as a constituent of sausages. About three tons a day could be produced. The report describes the deep vat batch process, which could no doubt be developed into a continuous process. The protein content was variable, sometimes reaching a high yield of 40% and sometimes only 25-30%, the balance being mainly chitin and cellulose. Only 2% fat was produced but more could be obtained if a longer growth period were permitted. Bacterial infections hindered the process and yeast infections almost completely inhibited production of the protein food. This plant was ready to give up this process and convert to the Berguis process for producing yeast protein from wood sugars. Diagram of the vat, rotating drum and agitator are shown. Growth curves are also included.

PB 23650. CLAYSON, D.H.P. and LEDINGHAM, G. A. Developments in pure and applied microbiology in Germany (American, British and French zones) during World War II. (BIOS Rept 236, Item 22) Sep 1945. 57 p. Price: Microfilm-$1.00 - Photostat-$4.00
This report is divided into four sections. Section A gives the reports on interviews held at various institutions with regard to the bacteriological work which was done during the war. Section B covers the field of microbiological protein production. In this connection descriptions are given of the production of torula yeast by the Bergius process and the Scholler process, and the production of Oidium lactes on waste sulfite liquor. Section C is concerned with the microbiological production of fats. The production of fat from Oidium lactes using whey and straw as the media is described. The fat process had been done only on a laboratory and pilot plant scale. Section D deals with the microbiological production of organic acids and a plant equipped to prepare lactic, gluconic, and citric acids is described. In the preparation of acids no new advances had been made. A bibliography is included in this report.

PB 25678. GOSS, W. H. Germany - fats, oils and oilseeds, Toeppfer's Oelwerke G.m.b.H., Hamburg. Aug 1945. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
This company is an affiliate of the Stettiner Oelwerke in Stettin. The East Asiatic Co., a large Danish trading firm with head offices in Copenhagen, owns 63 percent of Toeppfer's Oelwerke and of the Stettiner Oelwerke. The two companies specialize in the processing of soybeans for the East Asiatic Co. The expeller mill, extraction plant and refinery, and the processes used in each, are described. It is equipped to extract 300 to 350 tons of soybeans per day and to refine 40 tons of oil per day but was idle throughout most of the war.

PB 25675. GOSS, W. H. and MARKLEY, K. S. Germany - fats, oils and oilseeds, Holtz und Willemsen G.m.b.H. Oelfabriken. Sep 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a family-owned concern which operates a crude oil mill, a refinery, hardening plant and margarine factory in Uerdingen/Rhine. The processing in the press mill, in the refinery, in the fatty acid stills and in the margarine plant is described. The refinery contained a unique plant for the distillation of fatty acids from acidulated soap stock and for distillation of high free fatty acid oil prior to refining. This still, known as a Wecker still, is described in Hefter-Schönfeld Chemie u. Technologie Fette und Fetteprodukte (p. 528 et seq., 1937). The margarine is made according to the somewhat standardized formula of 60 percent hardened rapeseed oil, 40 percent liquid oil which is emulsified in the ratio of 80 percent fat to 20 percent water with addition of salt, carotene and potato meal. No diacetyl or glucose is added.

PB 25676. GOSS, W. H. and MARKLEY, K. S. Germany - fats, oils and oilseeds, J. H. Mohr & Co., Schlageterstr, 156, Hamburg/Altona. Aug 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
Mr. Hans Mohr, head of the Margarine Fach Gruppe, composed of 150 margarine plants, gave the present and past status of the Margarine industry described in this report. It is estimated that for normal diet 600,000 tons of margarine will be required in Germany during the next 13 months, or

500,000 tons of fat, or 1,200,000 tons of oilseeds (rapeseed 40% oil, copra 60% oil, palm kernel 50% oil, peanuts 50% oil, soybeans 20% oil). Mr. Mohr was questioned concerning the synthetic margarine or margarine made from synthetic fatty acids used on submarines at sea as long as eight months in the South Pacific, and by General Rommel in his North African campaign. He said this margarine would keep in ordinary packages for three to four months compared to six weeks for ordinary margarine. Capacity of the Mohr margarine plant and process used are described. This report will not reproduce well.

PB 25674. MARKLEY, K. S. and GOSS, W. H. Germany - fats, oils, and oilseeds, Hamburger Margarine Werke von Heinrich Voss. Aug 1945. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00
This firm is an independent company located in Hamburg, and not a member of the Margarine Union. Prewar margarine was made from cocomut, palm kernel, premier jus and neutral lard. At present only rapeseed oil is used, hardened oil obtained from Brake and Harburg, and soft oil from Thörl's in Harburg. Ripened milk was formerly used, but is now forbidden, and only water and diacetyl are used to produce butter flavor. The Manager had no personal knowledge of any margarine plant which has used synthetic fats. The manufacturing process is described.

PB 22453. PAVCEK, P. L. Phrix, A. G., Hamburg. (FIAT Evaluation Rept 1092; FIAT Final Rept 194) Aug 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
The five plants of this organization are primarily for the production of cellulose from pine wood and straw. Plants located in Hirschberg, Wittenberg and Kuestrin are designed to produce yeast as well, while the Seeburg and Krefeld plants do not produce yeast. The Wittenberg plant has been in operation since 1937, and up to 1939 utilized straw as the starting product. The sugars in the straw hydrolysate consist of 85 percent pentoses and 15 percent glucose and galactose. A strain of Torula utilis was used and the resulting yeast was sold chiefly as a food yeast. A yeast extract was manufactured from either the undried or dried yeast by strong HCl hydrolysis for 3/4 hour (reflux). After neutralization with sodium carbonate, the residue was centrifuged and again hydrolyzed, neutralized and centrifuged. The residue this time was dried and sold as cattle feed. The combined extracts are concentrated to 70 percent solids in vacuo. A special "tasteless" yeast was produced by thanol extraction of the dried yeast to remove the fat. (A similar product was achieved in the United States by methanol extraction. The dried yeasts were sold chiefly to pharmaceutical companies, e. g., Shering A. G., Berlin, and Tropowerke, Cologne. Ergosterol analyses on the dried product indicated a concentration of 0.6 percent. Samples of all types of yeasts collected were sent to Washington, D. C.

PB 25677. PAVCEK, P. L. Report on research on synthetic fats at University of Leipzig (Leipzig). May 1945. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report is chiefly concerned with the research work done by Dr. K. Thomas on the utilization and metabolism of synthetic fatty acids. The synthetic fats were prepared by Märkische Seifenfabrik in Witten a.d. Ruhr. Thomas found that these synthetic fats were only partially utilized by the body. Dogs and humans were used in these experiments.

United States

PB 23065. IVY, A. C. The tablet life ration for the shipwrecked. (Bur of Medicine and Surgery Project X-100, Rept 13) Jun 1943. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
The purpose of this report from the U. S. Naval Medical Research Institute, National Naval Medical Center, Bethesda, Md., is to provide more specific information regarding the advantages of the "tablet life ration" for the shipwrecked as compared with the existing Navy emergency rations provided for aircraft life rafts, life boats and other types of rafts. The tablet life ration is designed to supply a food which (a) is concentrated, easily assimilated, non-nauseating and pleasant to take in the presence of a dry mouth due to a limited water supply; (b) utilizes space allotted most economically; (c) when oxidized conserves body water; (d) will help support morale; (e) will serve as a single emergency ration for aircraft; and (f) is easily procured. Tables are included.

FUELS AND LUBRICANTS

German

PB 22721. BLOOMENTHAL, S. Improvement in the quality of bearings through the use of lubricant additives. (AAF ATSC T-2 Translation 446). n.d. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
This summary, prepared by S. Bloomenthal, of an article entitled "Verbesserung der lagereigenschaften durch schmiermittelzusätze" by R. Glocker, Stuttgart, discusses an investigation of the behavior of organic phosphorus bearing compounds as additives to lubricants to reduce seizure and friction, and permit use of higher bearing pressures. Various auto oils, turbine oils and a light oil used on the rudder of airplanes were tested. Technical bearing materials were also investigated. Tables are included.

PB 17596. GEWERKSCHAFT VICTOR, CASTROP-RAUXEL. Weiterverarbeitung W: Konstruktive berechnungsunterlagen, Jun-Jul 1941 (Data for further computation in construction). (MIS VII 67g 7003056; Folder 32). 1941. 50 p. Price: Microfilm-50¢ - Photostat-$4.00
The folder contains engineering and laboratory notes of the nitrogen and gasoline plant Gewerkschaft Victor. In German.

PB 27701. HOWELL, JOHN H. and CRAWFORD, ROY M. The production of synthetic fuels by the hydrogenation of solid and liquid carbonaceous materials. (Naval Tech Mission in Europe Tech Rept 217-45) Aug 1945. 121 p. Price: Microfilm-$3.00 - Photostat-$9.00
This report describes the principal methods of producing synthetic fuels by high pressure hydrogenation of coal and tar, as practiced in Germany. The various techniques of operation, designs of equipment, and characteristics of the products are described, and whenever possible, the relative merits and best uses of the different items are discussed. Important economic features of the industry are analyzed so that there is a technical basis for evaluation of the various phases in the light of existing local conditions. The data in this report were obtained either by interrogation of personnel, examination of documents collected from various plants, or by visual observation. Among the processes described are the T.T.H., "Tief-Temperatur-Hydrierung", or low temperature hydrogenation, and the Pott-Broche process. The drawings listed in Appendix D are not present in this copy. Appendix A contains tables among them being a table of German coals used for hydrogenation, the "brown" coal being used at Leuna and Wesseling and bituminous coal at Gelsenberg and Pölitz, and another table giving the summary of operation data for sump phase hydrogenation. Appendix C gives preparations for 5068 catalyst, 6434 catalyst, and Welheim gas phase catalyst no. K 536. Appendix D gives references.

PB 23856. HOWES, D. A. and THOMAS, W. H. I. G. Farbenindustrie A.G., Ludwigshafen - Germany, fuels and lubricants. (BIOS Final Rept 373, Item 30). Jul-Aug 1945. 173 p. Price: Microfilm-$2.00 - Photostat-$12.00
The conventional hydrogenation process comprising sump phase hydrogenation of bituminous coal, brown coal, tars, etc., followed by two stage vapor phase hydrogenation of the middle oils, was originally used extensively for the production of 87 O.N. type B4 aviation fuels. This was followed by a process modification in which the middle oils were converted into benzines by high pressure treatment with hydrogen under aro-

matisation conditions, allowing the production of the so-called CV benzines having aromatic contents of ca. 50%. It was found at a later date that the D.H.D. low pressure dehydrogenation process was to be preferred because it allowed the simultaneous production of more iso-octane or alkylate and was less dependent on feedstock quality when applied to heavy benzines produced in the conventional benzination process from middle oils. I.G. documents show the history of the production of aromatic type fuels since 1939. The authors state that little information of value was obtained on lubricating oils, motor fuels or Diesel oils. Diagrams, graphs, charts, and tables present data.

PB 25081. LUFT and HELLER. "Monergol" (balanced) propellants. (BIOS Halstead Exploiting Centre 5101). Feb 1944. 21 p. Price: Microfilm-50¢ - Photostat-$2.00
Most propositions for the operation of liquid propelled rockets which are independent of air, provide for the use of a system consisting of two components stored in separate containers, which react with one another when brought together through suitable nozzles and produce combustion ("Hypergole") or continue to burn if ignited by an external agent (nonhypergol two component fuels). "Monergole" (Balanced explosives) are compounds or mixtures which, in addition to an inflammable constituent, also contain the quantity of oxygen necessary to bring about combustion. In this report, which is an English translation of a German article the development of "Monergol" propellants (balanced explosives) is discussed in detail. In this development, the obvious thing was to make use of compounds and mixtures which are rich in energy, such as dinitrochlorohydrin (DAC), methylnitrate (Degussa) gas oil - nitrogen tetroxide (LFA, HAP), and ethylenechloride-nitric acid (HAP), which are familiar from explosive chemistry, and to apply them for "monergol" R propulsion. Tables and diagrams are included.

PB 25686. LUTZ. Lectures on special propellant for temperatures below 1500° K. given by Dr. Lutz on the 17.4.37 in the R.L.M. (BIOS Halstead Exploiting Centre Rept 10558) Apr 1937. 16 p. Price: Microfilm-$1.00 - Photostat-$2.00
This is a translation of a lecture given before the Reichsluftfahrtministerium. Propulsion units which carry the whole of the necessary propellant with them and have a weight themselves (they are thus completely independent of the external air) are required for many applications. In 1935, the author was commissioned to carry out research on the development of such propulsion units. The results of this work and its continuation are reported. The fundamentals of the problem are first discussed in detail followed by a discussion on the various fuels which may be utilized. The fuels are compared graphically as are the self contained propulsion unit and the aircraft engine.

PB 27200. PANARIELLO, VINCENT A. and others. German flamethrower fuels. (CWS 46th Chemical Lab Co Captured Material Tech Rept 35) Jun 1945. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
Viscosity charts and tables present physical and chemical characteristics of seven samples of German flamethrower fuels.

PB 19402. SCHNEIDER. Die ausbildung einer apparatur zur bestimmung der benzin-abreisstemperatur in flugmotoren, (Reichsforschungsrat) (Development of an apparatus for determining the vapor lock temperature of gasoline in airplane motors). (ALSOS Mission, RFR 506 1). Dec 1944. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
A previous report, issued July 7, 1944, proposed three devices, a so-called immersion bell apparatus, a mercury apparatus, and a glass pressure measuring bomb, for measuring the degree of condensation of a motor fuel on the basis of the pressure and temperature of the gas that escapes. This article reports tests with an improved mercury apparatus, which seemed to indicate that the vapor lock temperature was in inverse ratio to the velocity, dropping as the rate of speed increased. The extreme variability of other factors, particularly the temperature of the surrounding air, however, would seem to render it impossible to establish an estimate of this sort except on a comparative basis. In German.

PB 25220. SIEBENECK, HANS. Tests for lead in lead ethyl and observations on the volatility of tetraethyl lead. (AAF ATSC T-2 Translation F-TS-560-RE). Apr 1946. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translation of a captured German document. As reagent for the test of harmful lead in waste water, a 1% solution of dimercaptolthiodiazol is recommended. Limit of sensitivity is 3 mg. lead per liter. This reaction can also be generally employed for the detection of lead in hydrocarbons. Furthermore, tests proved that tetraethyl lead is volatile with hydrocarbon vapors within the ordinary daily range of temperatures.

PB 27071. U.S. NAVY DEPARTMENT. Oil storage construction in Germany. (Naval Tech Mission in Europe Tech Rept 244-45). Sep 1945. 59 p. Price: Microfilm-$2.00 - Photostat-$4.00
This report prepared by Geo. R. Wernisch contains information on four large Kriegsmarine (Navy) and one Wifo (Luftwaffe) oil storage facilities. Recent oil storage installations apparently are constructed underground. Sites are well chosen and camouflaged. Comments of several Kriegsmarine construction officials and information on concrete tank linings are included, as are photographs.

PB 25122. WALTER, H.,LTD., KIEL. Cold test for the F 5 u apparatus. (BIOS Halstead Exploiting Centre Rept 223) Jan 1943. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translation of a German report. Cold chamber tests show that a bi-fuel comprising 50% ingolin and mixture of 60% hydralin and 40% methanol can be entirely relied upon to work as low as -25° C. Slight variations in the oxygen excess value only favor the certainty of ignition. A table shows ignition delay in cold chamber tests.

PB 27316. WARREN, T. E. Inspection of hydrogenation and Fischer-Tropsch plants in western Germany during Sep 1945. (BIOS Final Rept 82, Item 30) Sep 1945. 29 p. Price: Microfilm-$1.00 - Photostat-$2.00
During September 1945 visits were made to hydrogenation and Fischer-Tropsch plants in the British Zone of occupation. The purpose of the visits was to obtain general information on the German synthetic liquid fuel industry. Plants visited were: (1) Union Rheinische Braunkohlen Kraftstoff A. G., Wesseling; (2) Gelsenberg Benzin A. G., Gelsenkirchen; (3) Hydrierwerk-Scholven A. G., (4) Ruhröl A. G., Bottrop-Welheim; (5) Ruhrbenzin A. G., Holten;(6) Chemische Werke, Essener Steinkohle A. G., (7) Treibstoffwerke Rheinpreussen, (8) Hoesch-Benzin, (9) Krupp-Treibstoffwerke G.m.b.H., (10) Klockneerwerke A. G., (11) Deutsche Fettesäure Werke, (12) Schmierölwerke Rheinpreussen, (13) Kaiser Wilhelm Institut für Kohlenforschung, and (14) I. G. Farbenindustrie Personnel, Heidelberg. Report from each plant visited covers: Location, description, and status.

United States

PB 25646. PENNSYLVANIA STATE COLLEGE. PETROLEUM REFINING LABORATORY. Effect of high temperatures on fluids in damper assemblies. (Rept 3.10-Jan 46) 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
Failures of thermoregulators in damping assemblies resulting in overheating and solidification of the damping fluid led to the investigations reported herein. The above named laboratory had been supplying damping fluids in relatively large quantities to the Navy Bureau of Ordnance. Their function is to cushion shock and retard the speed of various devices associated with range finding and fire control equipment. In nearly all cases, these fluids were composed of 2-ethylhexyl sebacate as the base stock, with varying concentrations of Acryloid HF 2000 as the polymeric viscosity-temperature coefficient improver. From tests which were conducted, it was concluded that the above described damping fluids are extremely stable at the normal operating temperature of 150° F. and are stable for at least fifteen hours at 250° F. When exposed to the atmosphere at temperatures

appreciable above 250° F., evaporation of the 2-ethylhexyl sebacate occurs. It was found that the heater used with the damper assemblies appeared to be entirely too large for the service required. Suggestions were given to improve this condition and thus to avoid overheating and consequent evaporation. It was suggested that the use of silicon oils as damping fluids in this type of mechanism might be desirable. A diagram and plotted curves are included.

PB 26545. PENNSYLVANIA STATE COLLEGE. PETROLEUM REFINING LABORATORY. Low temperature turbidity reference oils for evaluation of proposed barium sulfate turbidity test. (Rept 3.7-Dec 45) Dec 1945. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
Some difficulty had been encountered in interpreting in a reproducible manner the low-temperature storage stability and cloud point requirements of the hydraulic oil Specification AN-VV-O-366b. A previous report from this laboratory had outlined a method for comparing the subject test fluids after storage at low temperature with a turbid standard suspension of barium sulfate. The purpose of the present report was to present some of the detailed studies that had been conducted by the laboratory to clarify and expand this procedure and to describe a simplified but reliable test procedure that may be used by commercial producers and testing laboratories engaged in evaluating Specification AN-VV-O-366b hydraulic fluids. Information is included on methods of preparing standard barium sulfate suspensions, reference oils for checking the method, and low temperature stability.

PB 26547. PENNSYLVANIA STATE COLLEGE. PETROLEUM REFINING LABORATORY. Proposed revision of specification AN-VV-O-366b shear stability test procedure. (Rept 3.15-Feb 46) Feb 1946. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
The purpose of this report is to describe and illustrate the steps taken by the above named laboratory in developing a standard shear stability reference fluid in order to obtain better control of the shear stability of commercially-prepared specification AN-VV-O-366b hydraulic fluids. The need for such a reference is discussed and a method for compounding a reference fluid from suitable acryloid polymers and base stocks is given. Revision of pumping test procedures for this specification to include use of a standard reference fuel is recommended. Table I shows the viscosity-shear characteristics of experimental reference fluids containing acryloids 843 and 857. Table II shows the comparison of the shear stability of specification AN-VV-O-366b reference fluids prepared with acryloid HF-857 and acryloid HF-862.

PB 28870-28874. U. S. AERONAUTICAL BOARD. Army-Navy aeronautical specifications. Each specification is priced at $1.00 for a microfilm copy and $1.00 for a photostat copy unless otherwise noted. Revisions of these specifications are received by the Office of Technical Services as issued, and the latest revision will be included in the price quoted. Fuel; aircraft-engine, grade 130 (AN-F-28), PB 28873. Fuel; grade 73 aircraft-engine (AN-F-23), PB 28870. Fuel; grade 87 aircraft-engine (AN-F-25), PB 28871. Fuel; aircraft-engine, grade 91 (AN-F-26), PB 28872. Grease; extreme pressure low temperature lubricating (AN-G-10), PB 28874. Photostat $2.00

PB 27777. U.S. AERONAUTICAL BOARD. Grease; low temperature aircraft lubricating (low volatility type). (Army-Navy Aeronautical Specification AN-G-25). Apr 1946. 19 p. Price: Microfilm-$1.00 - Photostat-$2.00
Army-Navy specifications covering detail requirements, methods of sampling, inspection, and tests for low temperature aircraft lubricating grease are presented herein. Diagrams show test apparatus.

HIGHWAYS AND BRIDGES

PB 25409. BOWMAN, H. L. Articulated bridge for 30-ton loads. Oct 1943. 21 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report consists of four photostats of drawings and 11 prints of design computations of a bridge designed by Carson and Carson, Philadelphia, under contract with OSRD. The design contemplates the use of five parallel welded steel balk as main carrying members, each balk weighing 380 pounds, and use of wooden floor chess and 30" x 28'0" rubber tube floats which are already stocked by the army.

PB 25394. BOWMAN, H. L. Design of solid-floor treadway bridge. (NDRC Rept 12-34). Apr 1943. 10 p.
Price: Microfilm-$1.00 - Photostat-$1.00
This report relates to a bridge drawn for the Corps of Engineers, U.S. Army, by Carson and Carson, Engineers, Philadelphia, under contract with OSRD. It was designed to replace a bridge developed by the Armored Force and the Corps of Engineers which utilized treadways on rubber floats. Since a change of width had to be made and a full floor had obvious advantages, the bridge was redesigned as illustrated in the three prints attached to this report.

INSTRUMENTS (PROFESSIONAL, SCIENTIFIC AND CONTROLLING)

German

PB 26331. BUSCHER, tr. Electric fuse setting machines. (BIOS Halstead Exploiting Centre Rept 10399) n. d. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
An electric fuse was developed by the Germans equal to the clockwork fuse in accuracy of running time, but with the added advantage of being able to be set on firing. Diagrams show two forms of fuses developed, and a description of the experimental problems incident to the development of electric fuses and fuse setting machines is included in this translation from the German.

PB 12430. KSAU, A. Verfahren zur messung von geschwindigkeiten (A method for measuring velocities). German patent application K47060 IX/42-c, applied June 12, 1938. Granted Feb 6, 1939. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
Drawing included.

PB 22307. FLEISSNER, G. and VIEHMANN, H. Method for measurement of very small electromotive forces (Thermo E.M.F's.) through slip rings. (AAF ATSC T-2 Translation 483). Oct 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
By the method described in this article it is possible to run metal brushes on slip rings with an extremely low and constant resistance equal to that of a good stationary contact. This is achieved by the use of an auxiliary brush of graphite running on the slip ring and not carrying any current. A contact resistance of .001 to .01 ohm can be obtained, and this resistance is independent of the current. The voltage drop is independent of superimposed alternating voltages. Continuous runs over a few days are possible without any special effort. This is an English translation of a report of this work from Technische Berichte, Volume 9, No. 7, p. 227, 1942. Several references are given. The diagrams mentioned are not included, and the report may not reproduce well.

PB 17344. I. G. FARBENINDUSTRIE. Bestimmung des "kalten flusses" (Determination of cold flow). (Enlargement print of part of microfilm 180-2). Dec 1936. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
This document describes the construction and use of a simple device for measuring the various properties of Oppanol mixtures such as tearing resistance and impact resistance, etc. In German.

GER. PATENT 731007. RADIO MENDE (H.) & CO., DRESDEN Wellenmesser. (Wavemeter) Application M139026 VIIIa/21a4, Aug 1937. Original inventor: Priem. Jan 1943. 3 p.

PB 25330. BUHSTRAT, M. A., tr. Electric fuze setting machines. (BIOS Halstead Exploiting Centre Rept 10398) n. d. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
Drawings depict the fuze setting machine developed by the Germans for demolition purposes and described in this translation of a German document. Theoretical bases for this machine are not described herein.

GER. PATENT 730298. SEILER, RICHARD (inventor) Verfahren zur messung kleiner ultrahochfrequenter spannungen. (Method for measuring small ultra-high frequency potentials.) Application S136426 VIIIa/21a4, Mar 1939. Jan 1943. 4 p.

PB 1522. STEIN. Vortrag über reflexionsverminderung. (Lecture on how to reduce reflection) (ALSOS Mission, Gerlach 19) Dec 1944. 14 p. Price: Microfilm - 50¢ . Photostat - $1.00
This lecture given on Dec 15, 1944 by Dr. Stein, chief engineer of the German antiaircraft firms, reports on the experiments made by the German optical industry in cooperation with German research institutes how to improve the periscopes for submarines, of distance and photometers and of direction finders. Described is the Army binocular DF 7 x 50 and its mass production. The contribution of the firms Hayde, Dresden; Zeiss, Jena; Steinheil, Munich; Schneider, Kreuznach; Schott, Jena; Busch, Rathenow; Zeiss-Ikon, Dresden; Leitz, Wetzlar and others are mentioned.

PB 8936. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE, M.B.H., BERLIN. (A cathode ray oscillograph). German patent application T56561 VIII a/21a applied for Dec 1, 1941 and still pending. Addition to patent application T56348 VIII a/21e. Original inventor. Zeithammer. 1941. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
For T56348 VIII a/21e see PB 8901.

PB 9295. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Ionisationsmanometer mit nachgeschaltetem verstärker (Ionization-manometer with coupled amplifier). German patent application. Telefunken report number 8883 applied for Jan 12, 1945 and still pending. Original inventors: Krieg, Robeck. 1945. 4 p. Price: Microfilm - 50¢ - Photostat - $1.00
Not illustrated.

PB 8832. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE, M.B.H., BERLIN. Optische anzeigevorrichtung für elektrische spannungen. (Optical indicating device for electrical voltages). German patent 742268 applied for Mar 18, 1941 with number T55132. Original inventor: Steimel. 1941. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
Drawing only.

PB 8913. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE, M.B.H., BERLIN. (Portable measuring instrument). German patent application T56406 VIII d/21e applied for Oct 28, 1941 and still pending. Original inventor. Franz, Bach. 1941. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
A portable wavemeter.

PB 9239. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Ultrakurzwellenbolometer (Ultra short wave bolometer) German patent application T 61 332 VIIIa/21a4 applied for Jan 10, 1945 and still pending. Original inventor: Geilach. 1945. 4 p.
Price: Microfilm - 50¢ - Photostat - $1.00
Not illustrated.

GER. PATENT 728814. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M. B. H., BERLIN-ZEHLENDORF. Verfahren zur messung der phasenverschiebung von in der frequenz veränderbaren hochfrequenzen. (Method for measuring of the phase shift of variable high-frequencies) Application T53753 VIIIa/21a4, May 1940. Original inventor: Böttcher. Dec 1942. 4 p.

PB 26113. VANE, C., tr. Description of flow-meter to evaluate maximum thrust and ratio of C - stoff to T - stoff. Testing directions for a fuel-flow measuring apparatus. (BIOS Halstead Exploiting Centre Rept 235). Dec 1944. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
The fuel-flow measuring apparatus serves to ascertain maximum amount of feed, and the ratio of C/T-fuel at full, and low speeds. C-Stoff is a mixture of hydrazine hydrate, methane and water to which a catalyst is added. T-Stoff is 82-85% hydrogen peroxide. Water takes the place of corrosive liquids. By virtue of "Venturi Tubes", built into the suction pipes with measuring holes in front of, and inside the narrowest diameter of same, the differential pressure is transferred to U-tubes filled with mercury. The movement of the mercury is a measure of the quality of fuel flowing through, since the intake speed, as well as the diameters of the Venturi tubes are known. Plans and drawings referred to in the text are missing.

GER. PATENT 727326. WILHELMY, HANS-JÜRGEN and HENTRICH, WALTER (inventors). Rundfunktechnische messeinrichtung (Broadcast technical measuring device). Application W103811 VIIIa/21a4, Jul 1938. Oct 1942. 5 p.
Test oscillator for audio, I. F. and R. F. frequencies.

United States

PB 23672. FAIRCHILD CAMERA AND INSTRUMENT CORPORATION., JAMAICA, N. Y. Report on N.D.R.C. contract OEMsr-812: Part I. The Fairchild central station computer: Part II. The Fairchild .50 caliber M2 computer and AGS adaptations for an Emerson tail turret. (NDRC Rept 14-433) Apr 1945. 200 p. Price: Microfilm-$2.00 - Photostat-$14.00
This report is divided into two parts. Part I contains information on what the Fairchild central station computer, which automatically calculates lead, ballistic, and parallax corrections for a .50 caliber gun operated from a remote sight, was designed to do, and how it was accomplished. At the end of the paper is a tabulation of what the system did under test, together with functional and wiring diagrams and photographs. Part II is a summation of the work done and how the computor was designed to fulfill the specifications.

PB 23317. HARVEY, A. V. and others. Wide-range U.H.F. signal generators. n. d. 46 p. Price: Microfilm-50¢ - Photostat-$4.00
The purpose of this report is to give a general picture of the development of signal generators covering the frequency range from 90 Mc. to 10,000 Mc., by brief descriptions of design, performance and limitations of these generators, and to point out features which should be incorporated in future designs. This program of research was initiated at the Naval Research Laboratory, where the original development work and building of complete models were accomplished. Photographs and drawings are included.

PB 24873. HAUGEN, M. G. and WESTPHAL, W. B. The design of equipment for measurement of dielectric constant and loss with standing waves in waveguides. (NDRC Rept 14-541). Oct 1945. 66 p. Price: Microfilm-$1.00 - Photostat-$5.00
The purpose of this report XII is to summarize experiences on waveguide instruments obtained by the Laboratory for Insulation Research, Massachusetts Institute of Technology, while engaged in dielectric measurements and research. In Section I various methods for determining ε' and $\tan\delta$ are compared; Section II notes the factors entering into the design of standing wave equipment; Section III describes instruments used at present in the laboratory; and Section IV gives a short preview of some equipment which is still in the development stage. Tables, photographs, diagrams, bibliography, appendices for Sections I and II and corrections to report IX are included.

PB 19474. HEGGE, H. N. and GREENWICH, OLGA M. Wiring of electrical resistance strain gages. (Watertown Arsenal Lab Memo Rept 144/21). Jan 1946. 4 p. Price: Microfilm-50¢ - Photostat-$1.00

The successful use of electrical resistance strain gages is contingent upon correct and convenient mounting techniques. The method of wiring described herein, according to this report, has practically obviated wiring inconveniences, and has resulted in the elimination of most strain gage failures previously experienced. Procedures and findings of tests are described. Drawing and photograph of strain gage wiring are included.

PB 30771. JENSEN, HOMER and BALSLEY, J. R., JR. Position control for the airborne magnetic detector. n. d. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report gives the development by engineers of the Naval Ordnance Laboratory and the Geological Survey of methods for continuous clear indication of the position of the plane in relation to the terrain. The problem of position control can be separated into two principal divisions, that of flight guidance, and that of flight record. The first insures coverage of an area at the intervals and altitudes desired; the second permits the correlation of the airplane's position with the ground, and hence of magnetic data with maps of the ground. The complete photo coverage with aerial maps on a scale of 1:30,000 was divided into 30 mile North-South strips and flight lines laid out at intervals of one mile. Under guidance of the navigator, the pilot flew the lines at levels of 300, 600, and 900 feet, starting at the highest and ending with the lowest, most difficult run. Flight records were made on a split-field camera device which brought into the aerial view an image of all the significant settings of the magnetometer control box, plus a serial counter device which advanced each time the camera was advanced. The ideal way to record position was found to be by the use of the "Sonne" camera, made by the Chicago Aerial Survey Co., and modified for stabilized images by an optical mechanism using mirrors and vertical seeking gyroscopes. When the problem of surveying over water arose, the use of Shoran radio location device was decided upon, using a 1-milliampere Esterline-Angus recorder in series with the pilot-indicator, and a micro-switch operating an edgemark was made to be operated by a cam on the one-mile goniometer of the rate station, correlating magnometer and Shoran records at one-mile intervals. An altitude record was added to run continuously by modifying an APN-1 radio altimeter to make a record on a recording milliampere identical with that employed by the magnetometer and the Shoran. This established a continuous fix of a plane in flight so that its path in space can be reconstructed at any later date within a space of uncertainty no larger than a 100 foot cube.

PB 24876. JOHNSON, STANLEY A. Instructions for use of P.I.B. type 1E2 bolometer terminal. (Polytechnic Institute of Brooklyn Rept PIB-6-R-21-43; NDRC Rept 14-218). May 1943. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Subject instrument is designed for factory testing of power output of low power signal generator tubes operating at wavelengths in the band 8.5 to 11.5 cm. The short report includes a schematic drawing of the device.

PB 23690. ROJANSKY, V. Theory of a two-dimensional ballistic pendulum. Progress report. (NDRC Rept A-66; OSRD Rept 696) Jul 1942. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
A recent report by G. T. Reynolds and A. L. Kramer describes a double pendulum constructed at Princeton University for use in the study of the behavior of steel plates and other material when struck by projectiles of small caliber. The construction of this apparatus was carried out in close conjunction with theoretical studies, which included the present work on the theory of the idealized two-dimensional ballistic pendulum. While the individual equations of the two-dimensional theory are not of course directly applicable to the three-dimensional case, the main physical results afford information of considerable value in the design and use of actual pendulums. Schematic diagrams are included.

PB 25840. ROWE, A. M. Development of a hot wire anemometer. (Edgewood Arsenal Chemical Div Rept 306) Feb 1924. 29 p. Price: Microfilm-$1.00 - Photostat-$2.00
An investigation of several forms of hot wire anemometers to determine instantaneous fluctuations in wind velocity is described. A hot wire anemometer was developed according to the method of Huguenard, Magnan, and Planiol. By this method, current at a constant potential is supplied and the decrease in resistance of the hot wire when exposed to the wind, i. e., the increase in current is a measure of wind velocity. Rapid changes in wind velocities over a range of 0-25 miles per hour were successfully indicated. Recommendations for a recording instrument are given. Tables, calculations, graphs and diagrams of the hot wire anemometer are included in report.

PB 20138. SATHER, ORVILLE J. UHF power meter. (NDRC Rept 15-867-8) Apr 1944. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
An UHF power meter was designed and built by the Columbia Broadcasting System, Inc., to fill the need for an instrument to measure power at frequencies up to 1200 megacycles, to provide a visual indication of relative power output, and to furnish a non-reactive termination for a 50-ohm transmission line. A simplified schematic diagram of the unit and a cross-sectional view of the resistor housing are appended.

PB 27006. SHOEMAKER, DAVID P. and others. A capillary-type viscometer for use with solutions containing volatile solvents. (Calif Institute of Technology Rept 1034) n. d. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
A new capillary-type viscometer for the study of solutions containing volatile solvents has been designed and tested. Because the solution need not be transferred from the container in which it is prepared, measurements made with this viscometer on concentrated solutions of large molecules in volatile solvents are more reproducible than those made with an Ostwald-type capillary viscometer. By means of the new viscometer, viscosities of nitrocellulose samples can be estimated in Hercules smokeless seconds without employing the large quantities required by the standard procedure. A diagram of the viscometer illustrates the description.

PB 22074. U.S. WAR DEPARTMENT. Multimeter TS-369/U, Hickok models 202 and 202-MX. (Tech Manual 11-2673). Apr 5, 1945. 98 p. Price: Microfilm-$1.00 - Photostat-$7.00
The equipment described in this manual is basically an electronic measuring instrument combining the functions of four test instruments: a d-c millimeter and three electronic devices - a-c voltmeter, d-c voltmeter, and ohmmeter. The manual contains instructions for operating, maintaining, and repairing the equipment. Photographs and diagrams illustrate the text. The following are contained in the manual: Performance check list; trouble shooting charts; list of maintenance parts; and a list of references.

PB 20144. VAUGHAN, ERIC W. and KENNEDY, NORMAN. A square root amplifier. (NDRC Rept 15-759-24). May 1944. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This report contains a description, schematic diagram, performance data, and some constructional hints which apply to an amplifier designed to drive a standard Esterline - Angus 5 ma. recorder so that the deflection of the pen is proportional to the square root of the amplifier input voltage. With this amplifier power ratios of 20:1 (voltage 400:1) may be faithfully recorded. The amplifier operates in the audio range of frequencies from 1000 to 50,000 cycles. A graph which shows the performance of the finished amplifier is included. The work was done at the Ohio State University Research Foundation.

LUMBER AND WOOD PRODUCTS

PB 25591. LACEY, P. M. and others. German plywood, improved wood, shuttle block, and joinery industries. (BIOS Final Rept 348, Items 22, 31) Oct - Nov 1945. 96 p. Price: Microfilm - $2.00 - Photostat - $7.00

This report of visits to the following firms gives their principal products, and describes plants and manufacturing methods: W. Ritter, Hamburg (plywood machinery); Holsatia-Werke A.G., Hamburg (plywood); I. Brüning & Sohn, Lüneburg (plywood and blockboard); Donar Türen-werk, Hamburg (door); Westdeutsche Sperrholzwerke, Wiedenbrück (plywood and blockboard); Rottmann Söhne, Herford (blockboard); W. Ruhenstroth, Osterloh (plywood, blockboard and wallboard); Franz Torwegge, Bad Oeynhausen (plywood and blockboard machinery); Schaumburg-Lippsche Baubeschlägefabrik, Kirchhorsten (window and door fittings); Otto Bosse, Stadthagen (improved wood); W. Niemeier, Duingen bei Alfeld (furniture and door) F. Meyer & Schwabedissen, Herford (plywood machinery); -. Schnatmeyer, Herford (blockboard and furniture); Westdeutsche Werkzeugmaschinefabrik, Düsseldorf (engineering machinery); Arnold Kiekert Söhne, Düsseldorf/Heiligenhaus (window and door fittings); Wender & Dürholt, Remscheid/Lennep (window and door) G. Siempelkamp, Krefeld (plywood machinery) (Becker & van Hüllen, Krefeld (plywood machinery); Dynamit A.G., Troisdorf (wallboard and phenolic resin glue); Schütte-Lanz Holzwerke A.G. Mannheim/Rheinau (blockboard and plywood); Erwin Behr, Wendlinger bei Stuttgart (furniture and molded plywood); Rheinische Sperrholz & Türenfabrik A.G., Andernach (metal-faced plywood and door); Deutsche Holzveredelung G.m.b.H., Würdinghausen bei Altenbunden (improved wood for textile shuttles); Gebr. Schweing, Weseke bei Borken (textile shuttle); Holzveredelung G.m.b.H., Altenberge bei Horen-on-Ems (improved wood for textile shuttles. Appendix 1 consists of factory layout plan and machine inventory (Aug 1945) of I. Brüning & Sohn, Lüneburg. Appendix 2 consists of an article in German on veneer lengthening procedure describing special machines made by Becker & van Hüllen in conjunction with Brüning. Appendix 3 shows an illustration of a Schwabedissen machine. Appendix 4 consists of a copy of the 1938 illustrated catalog of F. Meyer & Schwabedissen, in English.

PB 27088. SCHRADER, O. HARRY, JR. Research and development in marine gluing technique at the Timber Structures, Inc. pilot plant, Seattle, Washington. Final report, Sep 1943 - Nov 1945. (OPRD Res Rept W-239) Oct 1945. 53 p. Limited free distribution; thereafter, Microfilm-$2.00 - Photostat-$4.00

This report covers the activities of a pilot plant program designed to develop the technique of laminating Douglas fir for use in the construction of naval and commercial vessels. A further goal was the promotion of use of laminated timbers under severe weather exposure conditions in other industries. Subjects discussed in this report include: Laminated products produced under the experimental contract, miscellaneous accomplishments, technique and equipment, experimental projects, including glue testing, preservative treatment, etc., publications and public relations, and future outlook for laminated timbers. The report states that with a decrease in the supply of logs that will yield high grade large size structural timbers laminated timbers will gradually take over and supply the market, provided costs can be reduced. Appendices present photographs and tables.

MACHINERY (EXCEPT ELECTRICAL)

German

GER. PATENT 708845. AKTIEBOLAGET SVENSKA KULLAGERFABRIKEN, GÖTEBORG, SWEDEN. Staubschutzvorrichtung für spindellager. (Dust protecting device for spindle bearings). Application A88886XII/47f, Nov 3, 1938. Original inventor: Thorén. July 30, 1941. 3 p.

PB 20082. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 152. Dec 1945-Jan 1946. 13 p. Price: Microfilm-50¢ - Photostat-$1.00

The reports which are collected here come from O(T) and CW and bear their report numbers as well as the B.I.O.S. numbers. Reports on the following firms and persons are included: K.W.I. für Eisenforschung, Clausthal (X-ray examination of metals and metallurgical research); Metallwerke Gustav Imhäuser, Olpernütte (metallurgy); Kronprinz A.G., Solingen-Ohligs (production of steel tubes); I.G. Farbenindustrie, Duisberg; Vereinigte Leichtmetall Werke, Hannover (aluminum foundry); Vereinigte Deutsche Metallwerke Halbzeugwerke G.m.b.H., Werdahl (production of aluminum and alloys); Messingwerke Unna A.G., Unna (tube and light alloy plant); Ruhrstahlwerke, Witten-Annen (steel production); Deutsche Edelstahl Werke, (tungsten steels for anvils); Dr. Walter Dawihl, c/o Ceram Werke, Berlin-Charlottenburg (tungsten carbide industry); Joost Rietveld, Berlin (tungsten free hard metal).

PB 34945. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 184. Jan-Feb 1945. 11 p. Price: Microfilm-50¢ - Photostat-$1.00

Summaries of reports nos. 3521 - 2532, in tabular form, giving names of German firms and persons, locations, principal products and interest, condition of plants, etc. Includes reports on the following: manufacturers of boilers, stokers, stoves, etc.; Vereinigte Kesselwerke, Düsseldorf; Walther & Co. Köln-Dellbrueck; Dürr Werke A. G., Ratingen-Ost; Siller & Jamart, Howrath, Wuppertal; Lindenburger Krankenhaus, Köln-Lindenrath (stoker plant); Cornelius Schmidt, Kupper-Steg; L & C Steinmüller, Gimmersbach; Verswerke Saarstadt; Senking BmbH, Hildesheim; Düsseldorf Gas Co. (gas production and supply); C. Kromschröder, Osnabrück (dry gas meters); and Krefft, Gevelsberg (enameling furnace).

GER. PATENT 712006. DEUTSCHE EISENWERKE A.G., MÜLHEIM. Schlackenwolle enthaltende dichtung für rohrverbindungen. (Packing containing slag-wool for pipe connections). Application S129469XII/47f Nov 12, 1937. Original inventor: Sprick. Oct 10, 1941. 2 p.

PB 18216. DUHM, E. Bericht über eine hochdruckanlage. (ALSOS Mission, Gerlach 11). (Report on a high pressure installation). Jan 1944. 3 p. Price: Microfilm-50¢ - Photostat-$1.00

Short report on repair work and improvements in a damaged high pressure installation of a not specified Munich institution.

PB 23409. DU PONT, STEPHEN. Gasoline powered hand tree saws. (FIAT Final Rept 696). Apr 1946. 7 p. Price: Microfilm-50¢ - Photostat-$1.00

The writer of this report found two gasoline powered hand tree saws of rather different design during his investigation of the German motorcycle industry, and gives a detailed description of their various parts and operation herein. One was made by the N.S.K. Werke A.G., Neckarsulm, Württemburg and the other was a "Dolmar" gasoline powered saw, type cl., made by "Dolmar" Maschinenfabrik, in Hamburg Bahrenfeld. The photographs and line cuts mentioned are not included with this report.

GER. PATENT 708917. FREUDENBERG (CARL), WEINHEIM, BERGSTR. Abdichtung gegen hohe drucke für bewegte maschinenteile. (High pressure packing for moving machine parts). Application F82334XII/47f, Jan 19, 1937. Original inventors: Loewis, Alexander von, and others. Jul 31, 1941. 4 p.

GER. PATENT 729128. FREUDENBERG (CARL), WEINHEIM. Aus elastischem werkstoff bestehende dichtung für umlaufende wellen oder hin und her gehende stangen. (Packing of elastic material for rotating shafts for reciprocating rods). Application F84564XII/47f Feb 1938. Original inventor: Simmer. Dec 10, 1942. 5 p.

GER. PATENT 719780. FREUDENBERG (CARL), WEINHEIM. Einbaufertiger dichtungsring zur abdichtung umlaufender wellen oder hin- und hergehender maschinenteile. (A prefabricated sealing ring for the sealing of rotating shafts or reciprocating engine parts). Application F83366XII/47f May 29, 1940. Original inventor: Simmer. Apr 16, 1942. 3 p.

GER. PATENT 706994. FREUDENBERG (CARL), WEINHEIM, BERGSTR. Kfigloser einbaufertiger dichtungsring zur abdichtung bewegter maschinenteile. (A pre-fabricated sealing ring used for sealing moving machine parts). Application F85660XII/47f Sept 22, 1938. Original inventor: Simmer. Jun 11, 1941. 4 p.

GER. PATENT 719683. GOETZEWERK GOETZE (FRIEDRICH) AG., BURSCHEID. Hitzebestndiger weichgraphitring fr stopfbchsenpackungen. (Heat-proof soft graphite ring for stuffing box packings). Application G100588XII/47f, Aug 17, 1939. Original inventor: Bremer. Apr 14, 1942. 2 p.
Not illustrated.

GER. PATENT 714782. GOETZEWERK, GOETZE (FRIEDRICH) AG., BURSCHEID. Plattenfrmige dichtung. (Gasket plate). Application G94255XII/47f Dec 1, 1936. Original inventor: Goetze. Dec 6, 1941. 3 p.

GER. PATENT 717627. HECKER (ARTHUR) ASBEST- & GUMMIWERKE, DRESDEN. Dichtung fr sich drehende wellen, bei der ein mit der welle umlaufender dichtkrper sich gegen eine geneigt zur wellenachse verlaufende gegenflche legt. (Seal for rotating axles in which the sealing part, rotating with the axle, faces an area inclined to the shaft's axis). Application H149365XII/47f Nov 1, 1936. Feb 18, 1942 4 p.

PB 27707. HERON, JOHN AHERNE. Some notes on German hollow turbine blade manufacture. (BIOS Final Rept 443, Item 5). Aug 1945. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
Because of the interest created by the progress attained in Germany on the manufacture and the use of hollow turbine blades, and the author's early attempts to interest the industry in this type of blading, it was felt that a visit should be made to investigate first-hand the methods used, for comparison with those proposed by the author. The places visited and reported here were: the Hermann Goering Institute at Volkenrode; B.M.W. at Munich; and W.M.F. at Geislengen.

GER. PATENT 720039. HUHN (GUSTAV), BERLIN. Dichtung, bestehend aus einem graphit- oder graphitkohlering mit metallischem mantel. (Seal consisting of a graphite or graphite-carbon ring with a metallic retainer). Application H145951XII/47f Oct 4, 1935 supplement to patent 704578. Apr 22, 1942. 4 p.

PB 17272. I. G. FARBENINDUSTRIE. Betriebsvorschrift zum turbonischer "Labor". (Directions for the operation of the laboratory size turbo-mixer). (Enlargement print of part of microfilm 180-3). Mar 1942. 1 p. Price: Microfilm-50¢ - Photostat-$1.00

GER. PATENT 713262. KUPFER-ASBEST CO. BACH (GUSTAV), HEILBRONN. Aus einem metalltrger mit fllstoff bestehende druckelastische dichtungsplatte. (A pressure-elastic plate gasket consisting of a metal support with filler). Application K155812XII/47f Oct 19, 1939. Original inventor: Augustin. Nov 4, 1941. 4 p.

GER. PATENT 720856. KUPFER-ASBEST-CO., BACH (GUSTAV), HEILBRONN. Dichtungsplatte, insbesondere fr brennkraftmaschinen. (A gasket sheeting, especially for combustion engines). Application K146192XII/47f Apr 16, 1937. Original inventor: Augustin. May 15, 1942. 3 p.

GER. PATENT 718438. KUPFER-ASBEST-CO. BACH (GUSTAV), HEILBRONN. Dichtungsring aus hochelastischem werkstoff. (Sealing ring of highly elastic material). Application K145898XII/47f Mar 21, 1937. Original inventor: Haug. Mar 12, 1942. 3 p.

GER. PATENT 713503. KUPFER-ASBEST-CO. BACH (GUSTAV), HEILBRONN. In ein mit press-sitz in der wellenbohrung sitzendes gehuse eingebaute einbaufertige wellendichtung. (A pre-fabricated axle-seal which is press-fit mounted in a housing in the axle bore). Application K148118XII/47f Oct 3, 1937. Original inventor: Haug. Nov 8, 1941. 4 p.

GER. PATENT 726354. KUPFER-ASBEST-CO. BACH (GUSTAV), HEILBRONN. Schleifringdichtung. (Slide-ring packing) Application K157102XII/47f Mar 21, 1940. Original inventor: Haug. Oct 12, 1942. 2 p.

GER. PATENT 715264. KUPPERATH, JOSEF UND FREY, CARL. Dichtung fr hohe druck- und temperaturbeanspruchungen. (Gasket for high pressure and temperature applications). Application K136107XII/47f. Original inventors: Patentees. Dec 18, 1941. 3 p.
Plate gasket for combustion engine cylinder heads and similar uses, interwoven of metal strips and wire without filling material.

PB 26999. MACLEOD, L. Some notes from the interview of Mr. Berendt of Blohm & Voss on the Blohm & Voss system of oil burning in marine boilers and an ignition starter for cold boiler starting. (JIOA Rept 70). Sep 1945. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
The Blohm & Voss oil-burning system was developed for automatic operation in conjunction with the "Askania" control. A description is given of this automatic burner and its function. The question of automatic burners on shipboard is covered by the following points: (1) They were used on naval ships but not on merchant ships; (2) whether it would be advantageous to use an automatic burner control on merchant ships would depend on the reliability of the system and its ultimate cost; (3) where a ship operates for long periods on a steady load it is open to question whether the extra expense of the rotary atomizer burner is justified. One drawing of the ignition starter is attached.

PB 23644. MAILE, A. M. The 16 cylinder air-cooled Diesel engine of the Simmering Graz Pauker A.G. (FIAT Final Rept 593). Dec 1945. 38 p. Price: Microfilm-50¢ - Photostat-$3.00
The 16-cylinder, air-cooled, supercharged Diesel engine type SLa 16 of the Simmering Graz Pauker A.G. is a modern successful development in its field and incorporates several novel features. The 16 cylinders are arranged in a "flat X" with 135° included angle, in four banks with four cylinders each. The crankshaft has four cranks and since four cylinders are in the same plane, three of the connecting rods are linked to one master rod. The crank angles and positions of the master rods are important for the balance of the engine. The angles used and projected and other design details for this engine are given, including an engine specification table and performance data based on one cylinder- and block- testing. Its performance exceeded the Maybach type HL 230 tank engine which it was planned to replace. A discussion of special features, a table of engines under development for heavy armored vehicles as supplied from memory by Dipl. Ing. E. Haustein, photographs and rough design drawings are included.

GER. PATENT 713797. MEYER, KURT. Dichtungsmasse aus phenolaldehydharzen und fllstoffen, insbesondere zum dichten von dampf- und hochdruckleitungen. (Packing material of phenol-aldehyde resins and fillers especially for the packing of steam and high pressure pipes). Application M132527XII/47f. Nov 1941. 2 p.

GER. PATENT 716102. NORDDEUTSCHE ASBEST- u. GUMMIWERKE WEBER (KURT) & CO., HAMBURG. Dichtungs- und isolierplatte. (Packing and insulating plate) Application M4034XII/47f Feb 7, 1937 supplement to patent 655166. Original inventor: Weber. Jan 13, 1942. 2 p.
Not illustrated. A fire resistant material is obtained by mixing equal parts of peat and powdered asbestos. This material, when processed with gluten and caustic soda may be used as packing material.

PB 27509. PANARIELLO, VINCENT and others. German oxygen transfer pump (sauerstoff-umfüllpumpe). (CWS 40th Chemical Lab Co. Captured Materiel Tech Rept 45). Feb 1945. 15 p. Price: Microfilm-$1.00 - Photostat-$1.00

GER. PATENT 710897. RASPE (CARL OTTO) and CO., BERLIN - WEISSENSEE. Zum abdichten umlaufender zylindrischer körper dienender dichtungsring. (A sealing ring for the packing of rotating cylindrical objects). Application I9600IIII/47f Dec 18, 1935. Sep 17, 1941. 4 p.

PB 17948. RUHRÖL G.M.B.H., HOTTROP. Ausrüstungsbogen. (Equipment installation data). (Mis VII 67g 7003090) 68 p. Price: Microfilm-$1.00 - Photostat-$5.00
The folder contains numerous sheets which list essential data on chemical equipment used by the Ruhröl comp. and make reference to drawings of their components. In German.

PB 17634. SCHOPPER LOUIS, LEIPZIG. Schopper prüfgeräte für pressstoffe. (Schopper testing apparatus for pressed materials). (Enlargement print of part of microfilm-185-3) n. d. 16 p. Price: Microfilm-50¢ - Photostat-$3.00
Manufacturers pamphlet containing a detailed description of 8 types of apparatus for testing the resistance of electric insulating materials, hard paper, fibres, etc. against tension, bending, hardness, temperature and glow heat. In German.

PB 17598. WALTHER-STRAHLUNGS-steilrohrkessel für 36 atü konzessionsdruck und 60/75 to/h dampfleistung (Walther radiation-rising tube-boiler with a permitted pressure of 36 atm. and a steam production of 60 to 75 tons per hour). (MIS VII 67g 7001763). 1946, 4 p. Price: Microfilm-50¢ - Photostat-$1.00
The sheet presents detailed drawings at various sections of the boiler which also has a superheater for heating vapors to 420°, a Makarieff forced-draught zones travelling grate (grate surface 32.29 m^2), a coil type preheater, and two air heaters. In German.

GER. PATENT 715190. ZAGORSKI, JOHANN. Stopfbüchsenpackung. (Stuffing-box packing). Application Z22499XIII/47f May 26, 1935. Dec 16, 1941. 2 p.
Not illustrated.

PB 25683. SUSE, K. Scientific and technical calculating machines, controlled by calculation-schemes (Rechenplaene). (BIOS Halstead Exploiting Centre Rept 10563) n. d. 63 p. Price: Microfilm-$2.00 - Photostat-$5.00
Calculation, as used in this report, is the derivation of result-data from any given data, according to prescription. An account is given of automatic computing machines which are able to carry out complicated calculations by means of simple relays. Thirty to fifty calculating operations can be carried out in one minute when using numbers. The computing machines automatically perform the conversion of the normal form of the initial values into a series of yes-and-no values and the conversion of result-values into normal normal form. The calculating operations can be controlled by hand, with a key-board, while long or repetitive operations can be regulated automatically, by means of punched cards to which the calculating machine responds. A storage system preserves values which are calculated and are to be used later. The methods of development of computing machines are clarified, and diagrams are included in this translation of a German document.

Italian

PB 23140. U. S. ENGINEER BOARD. Italian 2-cylinder, 2-cycle compressor and trailer: Evaluation report. (Rpt 39) Apr 1946. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
This brief report of captured enemy equipment presents a brief description and a photograph of the apparatus. The unit is comparable, with respect to utility, to the standard Engineer 105 cfm air compressor, U. S. equipment. An unusual design feature is the utilization of a four-cycle, two-cylinder diesel engine for the power plant.

United States

PB 23630. LOCKE, J. F. Preliminary tests on GE torque regulator for control of TG-100 turbine engine. (AAF ATSC Memo Rept TSNFR-580-175-7). May 1946. 19 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a report on tests to determine the operating characteristics of a torque regulator-fuel-governor system designed by the General Electric Company for use on the TG-100 turbine. This system is such that deviations in power plant torque from the desired value result in changes of blade angle, and deviations in r.p.m. from the desired value result in changes of fuel flow. A recording oscillograph was used to determine the operating characteristics by simultaneously recording propeller blade angle, beta lever position, datum lever position, turbine r.p.m., torque meter pressure and fuel pressure. A description of the test instrumentation is contained in Appendix 2. The prototype model is described, and the theoretical calculations of performance are given. The torque stand tests indicated that the torque regulator characteristics differed very widely from the design values. It was judged unsatisfactory and returned for re-work, to be tested again in the future. A schematic diagram of the control system and the oscillographs and data on the control characteristics of the prototype G.E. torque controller are included.

PB 23117. STONE, J. P. Wire cutters: Test report. (Marine Corps Equipment Bd Project 486). Jan 1946. 45 p. Price: Microfilm-50¢ - Photostat-$3.00
The purpose of the project covered by this report was to test the Porter heavy duty wire cutter with carrier in comparison with the M-38 wire cutter with carrier to determine the following: a. Adequacy in relation to function for which designed; b. carrying characteristics; c. best type and the defects and best features of each type; d. functional performance; e. durability; f. life of cutting edge and facility for re-sharpening; g. rust resistance; h. cutting capacity. Proceedings and findings of tests are described. Photographs, tables and graphs are included.

MEDICAL RESEARCH AND PRACTICE, INCLUDING CLINICAL APPLICATION OF DRUGS AND PHARMACEUTICALS

German

PB 20504. HAAGEN, E. Deutsche forschungsgemeinschaft (Correspondence of the director, Institute of Hygiene, Strassburg, and memoranda on virus research) (ALSOS Mission, Haagen 1). 1943-1944. 221 p. Price: Microfilm-$2.50 - Photostat-$15.00
This file contains a long report to the Reichsforschungsrat by Prof. E. Haagen of the Hygienic Institute of the "Reichsuniversität Strassburg" on virus infection. A method for the preservation of lymph for use against spotted typhus is briefly described. The file also contains a correspondence with Prof. Hallervorden of the Institute for Brain Research at Berlin-Buch on Encephalitis epidemica (Economo).

PB 27474. LEVINE, MELVIN L. German horse decontamination powder. (CWS 41st Chemical Lab Co Captured Materiel Tech Rept 3) Aug 1944. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27473. LEVINE, MELVIN L. German skin decontamination ointment 41. (CWS 41st Chemical Lab Co Captured Materiel Tech Rept 1) Aug 1944. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27062. LOVELACE, W. R. II. Summary of German aviation medical research. (AAF ATSC Eng Div Memo Rept TSEAA-660-99) Feb 1946. 49 p. Price: Microfilm-$1.00 - Photostat-$4.00
This is a summary of developments in German aviation medicine. In this report are covered first the tolerance of humans to accelerative and decelerative forces of magnitudes from 2 g to more than 6 g and second parachute design to reduce opening shock. In addition the subjects of physiological effects of pulsating pressure wave, of low temperature and rapid heat treatment, of low barometric pressure, and human engineering are discussed. The appendix contains reports covering the first two subjects mentioned and a general bibliography on all the topics mentioned above.

PB 25636. MONROE, L. A. and MORITSCHER, F. O. Utility of dibromsalicil; also Streptobacterium plantarum strain 10-8. (FIAT Final Rept 890) Dec 1945. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
This brief report describes the result of a second visit to Dr. Kuhn in Germany. Uncompleted tests on mice and guinea pigs indicate that dibromosalicil is effective against diphtheria, dysentery, and Rocky Mountain spotted fever. The formula for a culture medium for Streptobacterium plantarum strain 10-8 as used in Dr. Kuhn's laboratory is given.

PB 22461. PAYCEK, F. L. Chemisch-Physikalische Versuchsanstalt, Dänisch Hienhof/Kiel. (FIAT Evaluation Rept 1095; FIAT Final Rept 198). Aug 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Dr. Bitterling and Dr. G. von Studnitz had done some preliminary work on the utilization by humans of the Carotenoid pigments in a German flower known as the "Studentenblume". Human assay tests were performed, using improvement in night vision as a criterion. This report consists of a summary of a report (prepared in 1944) by G. von Studnitz, H. Wigger and H. K. L. Loevenich on "Influence of carotenoids on dark adaptation in man." The growing of the flower, Tagetes patula flore pleno, and the extraction of the principal ingredients mainly lutein is described. The dose is administered orally. The lutein effect was distinct from that due to the beta carotene present.

PB 22793. U.S. NAVY DEPT. DIV. OF NAVAL INTELLIGENCE. The cause of immediate death in blast injury and the pathogenesis of explosive decompression. Feb 1946. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
This short preliminary note records impressions received by a British official of the work of Professor Benzinger and Dr. Desaga who showed that air embolism can cause death following blast injury. The table detonation charge for the production of air emboli in air and in water is lacking.

Japanese

PB 25487. HENNIG, G. R. Dr. Morio Yasuda, Department of Biochemistry, Hokkaido Imperial University: Laboratory inspection report. Feb 1946. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a short report on studies carried on in the department of biochemistry. Some of them are published in Nihon Seikagaku-Kaishi (Proceedings of the Japanese Biochemical Society) vol. 18, 1943. The topics are: (1) Biochemical studies on phospholipid: (a) studies on the acetal phospholipid (plasmalogen), (b) on the existence of an amino acid in cephalin molecule, (c) on the structure of sphingosine; (2) on the physiological minimal requirement of ascorbic acid: (3) on the nutrition of the cold region (Hokkaido district) inhabitants; and (4) studies on milklipid. This work is reported by the 8250th Technical Intelligence Company.

PB 20776. KOBAYASHI, HAMUJIRO. Parasites and parasitic diseases of Korea. n. d. 22 p. Price: Microfilm-50¢ - Photostat-$2.00
The emphasis of this study, the result of thirty years' experience, is confined to morphology, systems, habits, and development of the parasites. It also contains remarks on epidemiology and control measures for the diseases caused by the various parasites. Parasitic diseases of highest incidence are amoebic dysentery, malaria, paragonimus, clonorchiasis, metagonimiasis, teniasis ascariasis, ancylostomiasis, filariasis (elephantiasis especially on account of Wucheraria malayi). For all these diseases mention is made of the regional distribution. Under the heading medical entomology there are treated ticks and mites, the red bug, fleas, mosquitoes and flies. This document will not reproduce well.

PB 23314. MITCHELL, RAYMOND W., JR. Report on Chiba Hospital, 313 Inohana chyo, Chiba, Chiba prefecture. (AFPAC Med Tech Intelligence Field Rept 3) Mar 1946. 44 p. Price: Microfilm-50¢ - Photostat-$3.00
This report describes the history of the hospital, its organization, administration, and medical personnel. Dr. Sadanobu Seo, the director of the surgical clinic, and his associates have done research on the following subjects: (1) Surgical correction of strictures of the rectum caused by lumphopathia venereum; (2) surgical removal of the carotid bodies for Raynaud's disease; (3) interarterial injections for various conditions; (4) x-ray treatment; (5) surgical procedures on the esophagus; (6) physiological surgery of the digestive tract. Attached are 12 photographs and the literal translations of the following papers: (1) treatment by the arterial-shock injection method; (2) surgery of the carotid gland; (3) a special lecture on the physiological operation of digestive organs.

PB 22148. STERN, SEYMOUR. Manufacture of anti-soft chancre bacillus vaccine, by Nitto Vaccine Sera Laboratory, Mukonachi, Kyoto Prefecture. (AFPAC, Medical Tech Intelligence Field Rept 1). Mar 1946. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
Intravenous injections are employed for acute cases, intramuscular for chronic cases. Although clinical investigation is insufficient to warrant proper evaluation, it was felt that the product should be investigated and the manufacturing process and other pertinent data be made a matter of record. An appendices gives the recommended usage.

PB 22127. U.S. ARMY. FORCES IN THE PACIFIC. MEDICAL ANALYSIS SECTION. Kit, detection of poison in food or water. (Rept 177). Feb 1946. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This Japanese kit is described briefly and two photographs are included.

PB 23605. U. S. ARMY. FORCES IN THE PACIFIC. MEDICAL ANALYSIS SECTION. Laboratory, chemical, field, for army. (Rept 184) Mar 1946. 45 p. Price: Microfilm-50¢ - Photostat-$3.00
This report is a description of a new Japanese Army field chemical laboratory. This laboratory was actually never used extensively since it was only experimental at the time the war ended. The laboratory is divided into two main sections. The "Poison" laboratory used for anti-gas and anti-prison determinations and a second section made up of three parts. The three parts are the "Sick" used for pathological studies in the field, the "Treatment" used for medical treatment, and the "Common-Use" whose equipment was used to supplement that of the two main sections as needed. Photographs of the Laboratory and lists of equipment contained in the laboratory are included.

PB 23316. U.S. ARMY. FORCES IN THE PACIFIC. MEDICAL ANALYSIS SECTION. Set, gas casualty treatment, wooden chests: Japanese medical equipment. (Rept 187). Mar 1946. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
This set, of four wooden chests containing chiefly various drugs for the treatment of gas casualties, is used in conjunction with hospital installations. The report contains a description of the set, a photograph, and an inventory list.

United States

PB 22987. HENRIKE, A. R. and MORGAN, J. E. Analysis of data: Rate of absorption of radioactive krypton measured in deep sea divers at the Experimental Diving Unit, Navy Yard, Washington, D. C., by Drs. J. G. Hamilton and H. B. Jones. (Bur of Medicine and Surgery Res Project X-43) Jul 1942. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
Twenty men, mostly deep sea divers, inhaled radioactive Krypton to determine whether or not the rate of saturation of the tissues in the lower forearm and hand could be used as an index of susceptibility to decompression sickness. There is no close correlation between a high saturation index and resistance to decompression sickness. In the upper group of ten men graded according to rate of gaseous saturation, four men were resistant to "bends", while in the lower group of ten men, only one man was resistant. However, the upper group included five highly susceptible men or the same number present in the lower group. The technique affords a precise method of measuring gas transport and absorption in the extremities. The constancy of results in repeated tests and the ease in making measurements stand in contrast with the difficulties involved in the determination of nitrogen elimination. In healthy men the procedure appears to be a means of determining effective blood flow to an extremity.

PB 22980. HENRIKE, A. R. and others. Measurements of CO absorption in man: A formula for computing concentration vs. time of exposure. (Bur of Medicine and Surgery Res Project X-160, Rept 2) Jun 1943. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a report of the U. S. Naval Medical Research Institute, National Naval Medical Center, Bethesda, Maryland. The rate of CO uptake by the blood was studied on 26 men during a total of 42 exposures to various concentration of CO in air from 5 to 20 parts per 10,000. It was found that in the range of blood concentrations observed (up to 35 per cent COHb) the uptake apparently follows a straight line. The principal factor affecting the rate of CO accumulation in normal men were expressed quantitatively in the form of the following equation:

$$\text{Time of exposure} = \frac{\text{Blood volume} \times \text{Per cent COHb}}{20{,}700 + 23.85\ (\text{Minute volume} \times \text{parts CO})}$$

based on the experimental data. The time of exposure is expressed in minutes, the blood volume in cubic centimeters, the minute volume in liters, and the parts CO in parts per 10,000. A simplified form of the equation for use as a gross approximation was obtained as follows: Time of exposure -

$$200 \times \frac{\text{Per cent COHb}}{\text{Minute volume} \times \text{parts CO}}$$

A bibliography, three tables, and six graphs are attached.

PB 22979. HENRIKE, A. R. and others. A study of repeated daily short exposure to high concentrations of carbon monoxide. (Bur of Medicine and Surgery Res Project X-160, Rept 1). Jun 1943. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
Four men were subjected daily to concentrations of 20 parts per 10,000 of CO gas for short periods. It was found that the breathing of uncontaminated air resulted in complete elimination of the CO in 24 hours, elimination being practically complete in 8 hours. By using oxygen, the elimination time may be cut down to 30-60 minutes. It was concluded that daily exposure of flying personnel to 15 parts per 10,000 of CO gas for short periods was permissible under emergency conditions. A table and graph of the elimination of the CO and bibliography are included. This report was contributed by the U.S. Naval Medical Research Institute, National Naval Medical Center, Bethesda, Md.

PB 22972. BLACK, A. P. and others. Patch testing (irritation and sensitization). (Bur of Medicine and Surgery Res Project X-180, Repts 1-4). Jul 1943. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
This report gives a summary of the results of tests carried out on human and animal subjects with regard to irritation and sensitization caused by flame-proofing compounds, "Devex Resins", camouflage ponchos, anti-oxidant oils, and corrosion preventive oils. This report is from the National Naval Medical Center, Bethesda, Maryland.

PB 26942. BOUDER, M. M. Fundamental study of toxicity. The carbon dioxide elimination and breathing rate of frogs. (Edgewood Arsenal Chemical Div Rept 483). Mar 1928. 14 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report considers the carbon dioxide elimination of frogs during the summer and winter seasons at different temperatures. Comparisons are made between the results on frogs and similar results on warm-blooded animals under approximately basal conditions. The metabolism of the frog, when measured above 20°C., is greatly influenced by temperature, increasing with rise in temperature, and being much higher in summer than in winter on the assumption that the ratio of the volume of air breathed to the carbon dioxide eliminated by man is the same for the frog, we have the following expressions: Volume of expired air, expressed as cubic centimeters per minute, is equal to 0.221 mg. CO_2/hr. (0°C., 760 mm., dry); and volume of inspired air, cc/min. equals 0.242 mg. CO_2/hr. (0°C., 760 mm. 50% R.H.). Based on these formulas, the values of the volume of air breathed by the frog are given in a table.

PB 22954. CONSOLAZIO, W. V. and others. The effects on personnel of various concentrations of carbon dioxide and oxygen under conditions of submarine operations (and addendum, May 31, 1945). (Bur of Medicine and Surgery Res Project X-349) Sep 1944. 57 p. Price: Microfilm-$1.00 - Photostat-$4.00
This is a report of the Naval Medical Research Institute, National Naval Medical Center, Bethesda, Maryland. In tests designed to study the effects of recirculated air, conducted for periods as long as 72 hours in a sealed laboratory room, and for a period of 60 hours aboard the USS S-17 alongside a dock and over a period of 50 hours aboard the USS DOLPHIN at sea, it was found on the basis of 500 cu. ft. of air volume available per man that: (1) the carbon dioxide will reach a concentration of 5 percent at the end of 35 hours, and that it can be readily controlled at this level for an additional 25 hours by means of soda lime absorption utilizing a blower system; (2) the oxygen will decrease from 21 to 15 percent at the end of 35 hours and to 12 percent at the end of 60 hours; and (3) under these conditions of elevated carbon dioxide and reduced oxygen concentration, personnel are able to perform their duties efficiently. Biochemical, physiological and psychological tests show no incapacitating effects. Submarine personnel standing their regular watches and performing their duties were able to remain submerged for 50 hours during which period the ship was maneuvered up to periscope depth five times from a depth of 100 feet. Minor symptoms of headache, nasal congestion, and dryness of the throat were followed by rapid recovery when personnel were subsequently exposed to outside air. The saving in oxygen (USS DOLPHIN) obtained by permitting the oxygen to decrease from 17 to 13 percent is of the order of 1600 cu. ft. (0.4 x 40,000) or 8 standard cylinders of oxygen, a total weight of 1,120 pounds. The saving in carbon dioxide absorbent (0.25 pounds per man per hour), in allowing the percentage to rise from 3 to 5 percent, is 310 pounds. Units consisting of a portable submarine blower, holding a canister of soda lime, proved to be a most convenient and effective method of promoting the absorption of carbon dioxide. One such unit sufficed for the USS S-17, and two units for the USS DOLPHIN. A bibliography, thirteen graphs, nine tables and a description of psychological tests are attached.

PB 22963. COREY, EDWARD L. Preliminary report of an experiment on the protection of animals against air-blast. (Bur of Medicine and Surgery Res Project X-64) Sep and Oct 1942. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a report also of the National Naval Medical Center, Bethesda, Maryland. Complete protection from blast was furnished to goats, rabbits and guinea pigs by a wood and earth shelter placed 140 ft. from a charge of 1,500 lbs. TNT.

Rabbits and/or guinea pigs, sheltered from missiles, but exposed to the blast at 32, 58 and 72 feet, suffered lethal injuries which were identical in character to those seen in animals exposed to underwater concussion. The traumatic effects of blast, whether air or water-borne, are similar, and are produced by the positive concussion wave.

PB 23440. COREY, EDWARD L. Report on further experiments on the effects of underwater concussion on divers. (Bur of Medicine and Surgery Project X-70) Dec 1942. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
This report continues the work of PB 23439 by Robertson, A. F. and Korty, W. M. The experiments were conducted from the U. S. S. WASSUC at a site in Chesapeake Bay where soundings showed a rather even bottom over an area two miles in diameter. A "course" was laid out from the anchored ship, buoy markers being set at 100-ft. intervals. Intervening distances were accurately measured by means of a graduated line. A rangefinder and statometer were also available for checking distances. The charges were placed at one-half the sounding depth from a work-boat. The experimental design is shown in enclosure A, the results in table 1. Charges exerting up to 30 lbs. per sq. in. (calculated) upon drivers may be tolerated with safety.

PB 23042. DUFFNER, GERALD J. and HAYTER, ROBERT. An investigation into the cause of drinking water contamination aboard the USS ICEFISH. (SS 367). (Bur of Medicine and Surgery Res Project X-588, Rept 1). Jan 1946. 21 p. Price: Microfilm-50¢ - Photostat-$2.00
The fresh water aboard the submarine was supplemented by water obtained by the distillation of sea water. Some members of the crew became ill when drinking the distilled water. A bacteriological examination revealed no infection. It was subsequently determined that the unpleasant taste of the water was due to the concentration of copper salts. There was no evidence that continued consumption of the drinking water aboard the Icefish had produced copper poisoning, but the taste of the water rendered it undesirable for drinking purposes.

PB 22988. ROE, JOHN F., JR. Carbon monoxide poisoning hazard on PT boats. Lead poisoning hazard on PT boats. (Bur of Medicine and Surgery Res Project X-54). Jun 1942. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
The concentrations of carbon monoxide were measured with the Carbon Monoxide Indicator of the Mines Safety Appliances Co. The conditions found on the various boats are recorded in a set of eight tables. Under usual operating conditions all hatches are open. With all hatches closed, dangerous concentrations were built up in the lazarette. When the "glands" of the mufflers were adjusted these concentrations could be reduced. In the second study the determination of lead excreted in the urine was used as an index of possible lead poisoning. It seems that there is unlikely any lead poisoning hazard connected with operating these boats. This document is from the Harvard School of Public Health.

PB 23043. FIESER, J. G. Review of available insect repellent literature on hand as of 20 June 1945. Progress report. (Bur of Medicine and Surgery Project X-504). Jul 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This progress report reviews recent literature on the subject of insect repellants and the impregnation of clothing with such repellants.

PB 22980. GEBHILL, C. L. and FUGITT, C. H. Physiological testing of MRS-1 oxygen mask. (Bur of Medicine and Surgery Res Project X-344, Rept 1). Mar 1944. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
Three types of the MRS-1 masks were physiologically tested at the Naval School of Aviation Medicine, Pensacola, Fla.: (1) Unlined; (2) chamois-lined; and (3) suede-lined. The mask was available in one size only, estimated to be large. In tests for fit on 101 men, the unlined mask failed on 34 men, the chamois-lined on 26, and the suede-lined on 19. The mask may be easily bent into and out of shape. This factor makes testing and use difficult. The mask is uncomfortable when worn for long periods of time. The acoustic and thermal properties are good. The mask was not recommended for use in service tests in that form. Test data relative to fit, comfort, resistance to flow, leakage are presented in tables. There are photographs of the mask and a curve showing results of perimeter tests. Other tests on this mask reported in PB 22964.

PB 22973. GREAVES, F. C. Study of injuries due to underwater concussions. Preliminary report. (Bur of Medicine and Surgery Res Project X-63). Aug 1942. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This report discusses the effects of underwater explosion on guinea pigs and white rats. The study attempted to determine the nature of the injuries produced and the efficiency of practical protective devices. Foam rubber, kapok, metal and adhesive tape were the protective materials used. This study was made at the National Naval Medical Center, Bethesda, Md.

PB 22982. GREAVES, F. C. A study of injuries from explosions of shallow water mines (and addendum by Edward L. Corey, Sep 12, 1942) (Bur of Medicine and Surgery Res Project X-62) Aug 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
A study was undertaken at Stump Neck, Md., to determine the damage to goats subjected to a series of explosions. Since no injuries were observed it was decided that, in order to produce disabling injuries that would render personnel unfit to carry out their assigned duties in an attack after landing, actual destruction of the landing boats would be necessary. A later test, described in the report of September 12, 1942, reported that even when the explosion was of sufficient violence to sink the boat the goats were not seriously injured, and point to the fact that injury from underwater blast is sustained only by submerged individuals.

PB 27063. GRIFFIS, LOYD M. Symposium on physiology of respiration as applied to aviation equipment. (AAF AFSC Eng Div Memo Rept TSEAA-660-83-M). Feb 1946. 228 p. Price: Microfilm-$5.00 - Photostat-$16.00
This report comprises a group of reports presented at the symposium of American naval and military men and research physicians held at the Aero Medical Laboratory, Oct 16-17, 1945. The following are titles of the reports: (1) Patterns of gas flow in human respiration; (2) the effect of physical activity, psychological stress, cold, altitude and flight conditions upon pulmonary ventilation; (3) resistance to breathing; (4) the design of oxygen equipment as influenced by the flow of respiratory gas; (5) pressure breathing; (6) the problem of carbon monoxide in aviation; (7) emergency descent from altitude; (8) the effect of oxygen, altitude, and exercise on breath-holding time; (9) anoxia in aircraft; (10) mask leakage considerations; (11) an attempt to define the degree of safety required of oxygen equipment in aviation; (12) aero-medical aspects of cabin-pressurization. A discussion as to the course of future development and research is also included. Many of the reports listed contain description of equipment, tables, pertinent diagrams and bibliographies.

PB 28528. GROESBECK, WILLIAM M. Report on toxicity of Manchineel tree and Tetlatin bush. (Edgewood Arsenal Chemical Div Rept 40) Jan 1921. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
The constituents of the specimens were isolated and tested on animals by introduction through the respiratory system into the lungs, by capsule into the stomach, by injection into the muscles and blood stream, and by direct application to the mucous membranes. The results in the main were negative. However, since the toxic principle is known to be volatile, it might have been that the toxic was lost or modified in transit. It was therefore recommended that the experiments be repeated with specimens collected and preserved by proper botanical methods. Test data and bibliography are included.

PB 22964. KENSON, MARGARET and KING, BARRY G. Appraisal of the suspension and fit of the MRS-1 oxygen mask. (Bur of Medicine and Surgery Res Project X-348, Rept 1). Sep 1944. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This report describes the tests that were conducted at the National Naval Medical Center, Bethesda, Md., on the MRS-1 oxygen mask. The mask gave an adequate fit in 39 of 96 trials on 32 subjects. The unlined mask fitted 50 per cent of the cases, the chamois-lined mask 34 per cent, and the capeskin-lined 37 per cent. The mask is available in only one size and cannot be adjusted to small or medium size faces. An adequate physiological evaluation of the design and construction of the mask itself, therefore could not be obtained. The mask was comfortable at room temperature. It did not protect the face against cold. Leakages into the mask are tabulated in three tables. (A test of the same mask is reported in PB 22960).

PB 22957. HOUSTON, C. S. and others. Comparison of voluntary pressure breathing and modified hyperventilation at 25,000 feet in the chamber and in operational aircraft. (Bur of Medicine and Surgery Res Project X-343, Rept 3). Sep 1944. 22 p. Price: Microfilm-50¢ - Photostat-$2.00
This is a report of the Altitude Training Unit, U.S. Naval Air Station, Miami, Florida. The purpose of the study was to compare voluntary pressure breathing (VPB) with a modified form of hyperventilation (MHV) in the low pressure chamber and in aircraft at 25,000 feet. In the chamber runs the percentage of subjects maintaining consciousness for 15 minutes with the two procedures was: VPB 88%, MHV 67%. In aircraft flights the percentage of subjects maintaining consciousness for 15 minutes with the two procedures was: VPB 27%, MHV 69%. In a control group tested in the chamber at 25,000 feet the percentage maintaining consciousness for 15 minutes with normal breathing was 7%. It is concluded that an emergency breathing procedure is desirable for high altitude operations and that MHV is preferable to VPB as it offers a greater chance of success in aircraft. A bibliography and nine tables are attached.

PB 22958. HOUSTON, C. S. and others. Evaluation of emergency breathing procedure at 25,000 feet. (Bur of Medicine and Surgery Res Project X-343, Rept 1). Jul 1944. 31 p. Price: Microfilm-50¢ - Photostat-$3.00
This is a report of the Altitude Training Unit, U.S. Naval Air Station, Miami, Florida. Instructions were given in emergency breaking procedure (EBP) at sea level, followed by practice and test runs in the low pressure chamber at simulated altitudes of 25,000 feet. A total of 120 man runs are reported. It was found that EBP can increase the oxygen saturation of the blood and thereby prolong consciousness in subject breathing air at 25,000 feet. EBP is difficult to learn and difficult to perform except under the most favorable circumstances. The ability of many subjects to perform EBP after they have become anoxic from a period of normal breathing is impaired to a point where no benefit is obtained from the method. Subjects have difficulty in performing EBP while attempting even simple tasks and tend to sacrifice EBP to complete their task; severe anoxia ensues. Consideration of the advantages and disadvantages of EBP indicates that it is not a practical procedure for the use of aviation personnel. In part 2 of the study the effects of EBP and hyperventilation were compared. The benefits obtained from EBP while breathing air at 25,000 feet are no greater than those obtained from hyperventilation alone. Hyperventilation performed at the rate of twelve to fifteen breaths per minute is easier and less fatiguing than EBP at the same rate. Five tables, sixteen graphs and three appendices are attached.

PB 22956. HOUSTON, C. S. and others. Evaluation of hyperventilation of ambient air at 25,000 feet. (Bur of Medicine and Surgery Res Project X-343, Rept 2). Aug 1944. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a report of the Altitude Training Unit, U.S. Naval Air Station, Miami, Florida. Object of the study was to determine the value of hyperventilation as a survival technique while breathing air at 25,000 feet. On nineteen of the forty runs (48%) subjects were in good condition at the time the masks were replaced. On twenty-one of the forty runs (52%) acapnia or anoxia required replacement of the mask prior to the required time. Oximeter readings indicate that most, if not all, of the increased arterial oxygen saturation obtained in emergency breathing procedure is due to the increased pulmonary ventilation rather than to the exertion of pressure. The exertion of pressure of some degree apparently is effective in decreasing the incidence of acapnia. If acapnia can be prevented by some modification of hyperventilation this procedure will be of more practical value since it is easier to learn and easier to teach. A bibliography, a table, and two graphs are attached.

PB 25494. KABAT, ELVIN A. and others. A study of the purification and properties of ricin. n.d. 20 p. Price: Microfilm-$1.00 - Photostat-$2.00
Highly toxic hemagglutinating preparations of ricin can be obtained by fractional precipitation with sodium sulfate. These products are electrophoretically, ultracentrifugally, and immunochemically homogeneous and identical in these respects with crystalline ricin, but are only two-thirds as toxic. The toxic and nontoxic forms can be separated by crystallization. Immuno-chemical and toxicity assays of crude extracts of castor beans indicate that these contain both forms of ricin. Ricin was found to have an isoelectric point of about 5.2 to 5.5 and a molecular weight by sedimentation and diffusion of about 77,000 to 85,000 for an assumed partial specific volume of 0.75. References and tables are attached. This work was done under NDRC contract at Columbia University.

PB 26938. KIBLER, A. L. Fundamental study of toxicity. Absorption by tadpoles of hydrochloric acid, sodium chloride, hydrocyanic acid, mercuric chloride, copper sulfate. (Edgewood Arsenal Chemical Div Rept 449). Apr 1928. 63 p. Price: Microfilm-$2.00 - Photostat-$5.00
The method of experimentation used was the analysis of the toxic solution before and after the exposure of the tadpoles to it. In the case of hydrochloric acid and sodium chloride, the electrical conductivity method was used to follow the absorption and the results of this method were checked by titration. In the case of hydrocyanic acid, the titration method alone was used. In the case of mercuric chloride and copper sulfate, attempts were made to use the conductivity method, but the lethal concentrations were so low that the method was unsuitable and no other method was attempted. Results are shown by means of tables and graphs. The lethal doses determined by this work are given.

PB 26937. KIBLER, A. L. Fundamental study of toxicity. Absorption of Arsenicals by tadpoles. (Edgewood Arsenal Chemical Div Rept 448). Mar 1928. 43 p. Price: Microfilm-$1.00 - Photostat-$3.00
The object of this work was to determine the laws of absorption of arsenicals by tadpoles and to determine the amount absorbed to produce 50% deaths. The method used is the analysis of the toxic solution before and after exposure of the tadpoles. The arsenicals used were methyl, ethyl, phenyl, and diphenyl arsenious oxides. For methyl, ethyl and diphenyl arsenious oxides, the amounts absorbed are proportional to the concentration in the solution. No absorption curve was determined for phenyl arsenious oxide. The amount of arsenicals absorbed from a solution of given concentration varies greatly with the experimental conditions such as temperature and activity of the tadpoles. The amounts of the several arsenicals absorbed to produce 50% deaths, together with comparable data determined by analysis of the tadpoles (Report 447) and corresponding data for dogs (Report 52 and supplement) by intravenous injection are shown in a table. Graphs.

PB 25357. KIBLER, A. L. The probability curve for tadpoles with fundamental laws of toxicity derived therefrom. (Edgewood Arsenal Chemical Div Rept 443). Mar 1928. 31 p. Price: Microfilm-$1.00 - Photostat-$3.00
The object of this work is to establish certain fundamental laws of toxicity from experimental data on tadpoles. The data for nine different toxics are examined critically and

evaluated. It is shown that when variations in dosage are plotted against per cent deaths obtained, a typical probability curve is produced. The form of this curve is offered as proof of the two laws given. The laws show that it is possible to establish a definite injury or toxicity scale for any given poison or for a series of poisons, and that when properly expressed in terms of this standard injury scale, any equivalent variation in time of exposure or concentration of toxic produces the same change in injury. Factors are derived for the evaluation of toxicity data on tadpoles when any per cent deaths other than 50% deaths are observed. These are quite accurate for percentages of deaths between 10 and 90. A curve is enclosed.

PB 22977. LEE, R. H. Determination of effect on dark adaptation of varying intensities of illumination in ready rooms. (Bur of Medicine and Surgery Res Project X-162, Rept 1). Jun 1943. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
Previous tests have shown that red, dark adaptor goggles are adequate to preserve dark adaptation in lighted rooms. This report is concerned with the tests which were made to determine the effectiveness of the goggles for the restoration of the dark adaptation once lost. Tests indicated that an illumination of ready room at an average of 20 to 30 foot candles combined with the wearing of goggles for a minimum of 45 minutes to insure a state of proper dark adaptation would make it possible for an aviator to have his night vision for fighting within two minutes after leaving the ready room. Tables and curves record test data. For later findings see PB 22978. This study was made at the National Naval Medical Center, Bethesda, Md.

PB 22978. LEE, R. H. and others. Determination of effect on dark adaptation of varying intensities of illumination in ready rooms: Newly discovered fluctuations of periodic nature occurring in dark adaptation Thresholds. (Bur of Medicine and Surgery Res Project X-162 Rept 2). Sep 1943. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This report records the discovery of a phenomenon which makes necessary a reconsideration of the conclusions which were stated in report no. 1 of this project (PB 22977). This phenomenon consists of a wave-like fluctuation with a 3 to 7 minute period and an irregular amplitude of from 0.05 to 0.25 log units test brightness. It has been found in all dark adaptation thresholds below the highest levels. When these fluctuations are taken into account and comparisons of data are made by superposition of the individual curves, it becomes apparent that no advantage is to be gained by wearing dark adapter goggles longer than the 30 minutes now recommended. Ready rooms should continue to use illumination of 20 to 30 foot candles. If all red light is used the intensities should be between 2.5 and 3.8 foot candles. This study was made at the National Naval Medical Center, Bethesda, Md.

PB 22984. LEE, R. H. Exploratory project on growth curve of light adaptation. (Bur of Medicine and Surgery Res Project X-142). Apr 1943. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
The state of adaptation of the eye to the dark depends on the time of exposure to a light source as well as the brightness of the source. On this basis recommendations are made for the procedure to be followed in further studies on adaptation of the eye to the dark. The figures and tables mentioned are lacking in this copy. This document is from the National Institute of Health, Bethesda, Maryland.

PB 22959. LOZNER, E. L. Studies on liquid plasma during second year of storage. (Bur of Medicine and Surgery Res Project X-105, Rept 1). Jul 1943. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a report of the National Naval Medical Center, Bethesda, Maryland. Preliminary chemical findings on 18 samples of plasma preserved in the liquid state for 15 to 24 months at room temperature are presented. During storage of such duration, the nonprotein nitrogen content, the amino acid nitrogen and the "residual" nonprotein nitrogen all appear to increase slightly. No chemical changes can be detected in the total protein albumin or globulin content but it appears from the increase in nonprotein nitrogen and amino acid nitrogen content that from 0.5 to 1.0% of the protein is hydrolyzed. Therefore, 99.0 to 99.5% of the precipitable protein can be said to remain intact from the chemical point of view. Two electrophoretic patterns on plasma 15 and 24 months old were within normal limits. When plasma is prepared by a "closed" system with scrupulously aseptic technique, its expiration date when preserved in the liquid state at room temperature in a moderate climate may be extended from the present limit of one year to 18 months and probably to 2 years. One table is attached.

PB 22662. MASSACHUSETTS INSTITUTE OF TECHNOLOGY. DEPARTMENT OF BIOLOGY. The X-ray diffraction patterns of normal, deaminated, and partially deguanylated kangaroo tendon. n.d. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
The X-ray diffraction patterns examined both without electron staining and with Calgon or phosphotungstic acid stains, show definite alterations in relative order intensities. The most significant changes are in the neighborhood of the fifth to seventh orders.

PB 25360 and PB 25361. MILLER, C. E. and REED, A. E. Fundamental study of toxicity. Toxicity and narcotic values of various compounds toward tadpoles. (Edgewood Arsenal Chemical Div Rept 442 and 442, supp 1). Mar 1928, Feb 1932. PB 25360. (Rept 442), 117 p. Price: Microfilm-$3.00 - Photostat-$8.00. PB 25361. (Rept 442, supp 1), 34 p. Price: Microfilm-$1.00 - Photostat-$3.00
The work reported in these documents was undertaken with the end in view of developing a method for the accurate, rapid and comparatively inexpensive method of determining toxicity of chemical warfare agents. Tadpoles were chosen as the experimental organism because of their availability, cheapness, ease of maintenance, and the fact that they are water-breathing animals which allows a definite concentration of the toxic to be established more accurately than with animals deriving their oxygen directly from the air. Lethal concentrations for about one hundred and twenty compounds have been determined for various times of exposure. Minimal narcosis concentrations have also been determined for a certain class of the compounds investigated.

PB 23068. PFEIFFER, C. C. and others. Studies on the possible toxicity of sea water desalinated with Permutit BaH briquets. (Bur of Medicine and Surgery Res Project X-127, Rept 12). Aug 1945. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Both the precipitated salts resulting from the use of Permutit "BaH" briquets and the desalinated sea water have been assayed for possible toxic effects in growing rats. It was concluded that small amounts of the residue resulting from the Permutit "BaH" desalination of sea water can be ingested without producing evidence of intoxication. Desalinated sea water as a sole source of fluid is nontoxic except for a moderate laxitive effect. Test data is included in report.

PB 22961. RILEY, R. L. and others. Hyperventilation breathing air as a means of maintaining consciousness at 25,000 feet. (Bur of Medicine and Surgery Res Project X-454 Rept 1). Sep 1944. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a report of the Naval School of Aviation Medicine, U.S. Naval Air Training Bases, Pensacola, Florida. Fifty male subjects were instructed briefly in the procedure of hyperventilation and then were exposed to a pressure-altitude of 25,000 feet in the low pressure chambers while breathing air. Twenty-four (48%) remained "conscious" for 15 minutes; twenty-six (52%) required added oxygen before 15 minutes had elapsed. The minute respiratory volume approximated 20 to 30 liters. Many symptoms of anoxia were noted; none were serious. A bibliography and one graph are attached.

PB 23439. ROBERTSON, A. F. and KORTT, V. M. Safety of divers during countermine test work. Report of test of October 6, 1942. (Bur of Medicine and Surgery Project X-70; Naval Ordnance Lab Memo 2481) Oct 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Ten and fifty-three pound charges of nitramon were detonated at various distances from submerged divers. The closest ten-pound charge (at 460 feet) was found to be audible but without pressure effect. This corresponds to an instantaneous peak pressure of about 50 lb./in^2. A fifty-three pound charge at 1100 feet was merely audible, but at 980 feet the pressure effect was quite noticeable. This pressure effect also corresponds to an instantaneous peak pressure of about 50 lb//in^2. For continuation of these experiments see PB 23440 by Corey, E. L.

PB 26939. SPENCER, H. W. and KINLER, A. L. Fundamental study of toxicity. Absorption of physically acting toxics by tadpoles. (Edgewood Arsenal Chemical Div Rept 450). Oct 1927. 96 p. Price: Microfilm-$2.00 - Photostat-$7.00
This is a report of work done to determine the laws of absorption by tadpoles for the comparatively large class of physically acting, chemically inert toxics which may be loosely termed narcotics. The method followed was to place tadpoles in a solution of the narcotic of the desired concentration and to withdraw a sample and determine its concentration by means of the Zeiss water interferometer. The narcotic lost by the solution is considered to have been absorbed by the tadpoles. It is shown that for this class of toxics, the course of the absorption is represented by typical equilibrium curves. Equilibrium is reached in about 60 to 90 minutes. At equilibrium, the amount of toxic within the body of the tadpole is represented by the following conditions: 1. The concentration in the water content of the tadpole is approximately the same as that in the water around the tadpole, 2. The concentration in the lipoids of the tadpole is approximately represented by the product of the concentration in the water around the tadpole and the partition coefficient of the toxic between olive oil and water. Graphs illustrate the report.

PB 25229. SUGAR, OSCAR. Collapse reactions due to lowered barometric pressure. (AAF AMC Eng Div Memo Rept TSEAA-696-101). Apr 1946. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This report is a summary of available data and opinion on collapse reactions due to lowered barometric pressure or anoxia, the prevention of such collapse, and treatment when collapse occurs.

PB 23037. TURNER, J. McCULLOUGH and others. Toxic gases from assisted take-off units, (JATO). (Bur of Medicine and Surgery Res Project X-463, Rept 1). Oct 1944. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
The report describes experiments to evaluate the possible toxic hazards to personnel exposed to gases and smoke from assisted take-off units (JATO). Gross examination of guinea pigs, exposed to the exhaust 22-50 feet from the unit nozzle, and microscopic examination of their lungs revealed no acute changes from the normal. The blood of one guinea pig was found to contain a negligible amount of carbon monoxide hemoglobin. The short time of exposure (less than one minute) prevented injury from the relatively high CO and HCl concentrations. It was concluded that a more accurate evaluation could be made only by actual tests aboard an aircraft carrier. This work was done by the Naval Medical Research Institute, National Naval Medical Center, Bethesda, Maryland.

PB 23402. U. S. ENGINEER BOARD. Efficiency of standard Army water purification equipment and of diatomite filters in removing cysts of Endamoeba histolytica from water. (Rept 834) Jul 1944. 77 p. Price: Microfilm-$1.00 - Photostat-$6.00
The tests covered by this report consisted of introducing a predetermined number of cysts of the NRS strain into the raw water, passing this water through filters, and collecting samples of the effluent at regular intervals for microscopic examination. Chemical and bacterial analyses of the influent and effluent of a number of tests were made as an additional control. The equipment used consisted of U. S. Army Portable Water Purification Units, Model 1940, and diatomite filters. It was found that diatomaceous silica filtration is much more effective than sand filtration for the removal of amoebic cysts. Design features being essential for best results are indicated. The combination of pretreatment, sedimentation, and filtration gives results considerably better than filtration alone. Eight photographs, forty five test results data sheets, and two graphs are attached.

PB 22966. WEBSTER, STEWART H. and others. An interim report on the stibine study. (Bur of Medicine and Surgery Res Project X-166). Jun 1944. 41 p. Price: Microfilm-50¢ - Photostat-$3.00
This is a report of the National Institute of Health, Bethesda, Maryland. The object of this part of the stibine investigation was to determine the toxic effects of antimony hydride or stibine, using several species of laboratory animals as experimental subjects. This highly toxic gas acts as a secondary irritant, affecting chiefly the deeper structures of the lungs and producing congestion, edema, or even hemorrhage. Death may result fairly quickly. With some animals the irritant properties can be noted from the watering of the eyes, rubbing of the nose and/or mouth, running of the nose, salivation or even rales. The secondary action appears to be due chiefly to the action of antimony hydride and/or its decomposition products on the blood. The effect of this hemolytic agent is considered with reference to (1) change in shape and number of the erythrocytes, (2) hemoconcentration, (3) alteration in the leucocytes, (4) change in hemoglobin and hematocrit values, (5) occurrence of hemolysis, (6) cell fragility, (7) action of antimony hydride on red cells both in vivo and in vitro, and (8) miscellaneous measurements, such as coagulation time, icteric index and prothromb in time. The experimental findings on the urine specimens are described with reference to the occurrence of hemoglobin, albumin, urabilin, urobilinogen, and methaemoglobin. The effect of the agent on urine excretion and the experimental work with acid diets are mentioned. The relationship of bilimbin formation to that of hemolysis in the experimental animals is discussed. The chief pathological findings in the lungs, liver, kidneys, and spleens of the animals examined are described. Comparison of acute and chronic toxicity on a few animals suggests that some tolerance to antimony hydride may be acquired rather rapidly. It is also apparent that the agent may stimulate erythropoiesis.

PB 22962. WHITE, W. A. Oxygen poisoning in man, effect of cysteine hydrochloride and ammonium chloride on the time of onset of toxic symptoms. (Bur of Medicine and Surgery Res Project X-436, Rept 1). Aug 1945. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
Nine divers breathed 99 per cent oxygen in a decompression chamber at a pressure of 44.5 pounds per square inch (gage) after (a) No medication, (b) 1.0 gram of ammonium chloride, (c) 0.25 gram of cysteine hydrochloride, (d) 0.7 mg. of quinine sulfate (control) and (e) 1.5 grams of cysteine hydrochloride. The drugs were administered two hours before the start of oxygen breathing. The administration of the drugs at the dosage used did not significantly alter the interval from the start of oxygen breathing until the onset of signs or symptoms of oxygen poisoning (oxygen tolerance time). Two tables are attached. This document is from the Naval Medical Center, Bethesda, Md.

METALS AND METAL PRODUCTS

German

PB 26014. DIRKSEN. Letter by Dirksen on his work on ceramics increase of thermal conductivity by admixture with metals. (BIOS Halstead Exploiting Centre Rept 542) Feb 1946. 3 p. Price: Microfilm-50¢ - Photostat-$1.00

This is an English translation of a German report on tests of iron rods and rods of aluminum-oxide. On rods with 60% iron and the balance aluminum-oxide, the tensile strength and Vickers hardness are given. On rods 20% iron and the remainder aluminum-oxide, inflammability tests were in progress, as well as fatigue tests with only partial results given on the latter.

PB 17391. GERMANY. REICHSMINISTER FÜR RÜSTUNG UND KRIEGS-PRODUKTION. Bericht über die 1. sitzung des arbeiteringes eisenpulvererzeugung am 29.2.44 (Report on the first meeting of the section for the production of iron powder on Feb 29, 1944). (VII 70 a 20 7000637). Mar 1944. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
The leader of this meeting was Dr. H. Buchholtz, this section being "Arbeitering Eisenpulvererzeugung im Hauptring Werkstoffveredelung". After introductory remarks on organization and purpose of the new section, lectures on the following topics were delivered and discussed: Mechanical powders, sponge iron- and reducing-powders, centrifuge powder, atomized powder, the Berghaus chlorination process, recovery of iron oxide and sulphuric acid from iron sulphate, production of iron powder by reduction of iron oxide, the Walther-process for the reduction of ores by hydrogen under pressure, and the basic principles of the raw iron-cinder layer process. For description of the last mentioned process see PB 17380, under Scholz. In German.

PB 27520. GLOSS, EUGENE E. German ball and roller bearing manufacture. (FIAT Final Rept 386) Dec 1945. 24 p. Price: Microfilm-$1.00 - Photostat-$2.00
This study of the German anti-friction bearing industry was undertaken to investigate any new production methods that had been developed during the war years. Research and development work was confined to a search for substitutes for material that was scarce or expected to be in short supply. The pressure of current needs was so great that no routine bearing life tests were run during the last two years of the war. Production was inferior to American production in general. The report discusses wood retainers of pressed wood tubing; vapor lubrication of high speed spindle bearings; production of bearing races by an upset forging process; and production of unground case hardened carbon steel bearings. Appendix I gives materials used for races and for forging machine tools as well as specifications for rings of various diameters and the third gives a long operation chart of the sequence of operations, machines used, methods of inspection and machining time per unit. A list of bearing plants visited and personnel interviewed is also appended.

PB 17385. GONTER, HERBERT. Vorrichtung zum schmelzen, absetzen und veredeln von metallschmelzen, insbesondere leichtmetallschmelzen (Device for the melting, settling, and refining of fused metals, especially of light metals). (MIS VII 70 d 7000011). May 1943. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
The text is a description of an application for a design patent, apparently by Hensel-Werke, A.G. Claim is made for a rotatory hearth-crucible furnace, alongside which the crucibles receiving the melts pass continuously so that the melts settle and become refined. To fill the crucibles a collecting or intermediate oven is used in the furnace system. Lifting and lowering devices controlled by compressed air are installed at the places of filling and refining. Use is made of electric-resistance heating. The various phases of operation are controlled from a central platform. The diagrams mentioned are lacking. In German.

PB 27389. HARMSEN, tr. Procedure for producing refined powder from molten masses by means of gases or steam on employment of nozzles. (BIOS Halstead Exploiting Centre Rept 620). May 1943. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is an English translation of a German patent application dated Berlin 1943. In the production of metal powder, in particular iron powder, for the purpose of metal ceramics, the oxidation of the powder particles was hitherto regarded as an undesirable side-effect and was, if possible, avoided. The metal jet divided by means of steam or gas was for this purpose directed onto cooled surfaces and if necessary water was simultaneously injected into the steam or gas nozzle to accomplish the quickest possible cooling of the powder. This invention claims: (1) Procedure for producing iron powder by spraying crude iron or an iron carbon alloy in the known manner and subjecting the powder in a solid state to a fining process with aid of iron oxides and subsequently reducing it with hydrogen; (2) Procedure according to claim 1, in which the iron oxide is produced during the spraying of the iron as a coating on the powder; (3) Procedure according to claim 1 and 2, characterized by the use of an original material with low silicon content; and (4) Procedure according to claim 1 and 2, characterized by the use of an original material which is free from silicon.

PB 14953. LUYKEN, WALTER. Über die aufreichung von minette (Kaiser-Wilhelm-Institut für Eisenforschung). (ALSOS Mission, Hoyt File 146) May 1945. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
This work was undertaken with the object of concentrating iron ores. Ores from Lorraine and Luxembourg were roasted in a reducing flame at a temperature of 750°-800° and then air cooled. The reduced ore was then finely ground and magnetically separated. Results show that the ore was considerably concentrated with regard to iron, manganese, and phosphorus, calcium being lost. Photomicrographs show differences in the structure of various ores. This work was done at the Kaiser-Wilhelm-Institut. In German.

PB 14951. LUYKEN, W. Verteilung des vanadins auf die erzeugnisse bei der aufbereitung von eisenerzen (Kaiser-Wilhelm-Institut für Eisenforschung). (Distribution of the vanadium in the products resulting from the dressing of iron ores). (ALSOS Mission, Hoyt File 138) May 1, 1945. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
Further studies were made on the concentrating of iron ores (see PB 14953). In this report an attempt has been made to determine the distribution of vanadium among the constituents of the various ores tested. No definite conclusions are reached since in one case the vanadium appears linked to the iron and in another it appears to be linked to the tetantum and aluminum. Tables show the composition of the ores studied. In German.

PB 25068. MARKS, F., tr. Instructions for the heat treatment of steel TLM 0108. (BIOS Halstead Exploiting Centre Rept 1055). Jul 1941. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Instructions are given in this report for the hardening and tempering of finished and prepared steel parts. The procedures for hardening and tempering steel and for case hardening are listed in consecutive order. This is followed by brief descriptions of the methods for carrying out these procedures, which include tension-free annealing, hardening and tempering, release of hardened parts, insertion of parts to be tempered, tension-free annealing of tempered parts, and case hardening. This is an English translation of a German report.

PB 27456. PANARIELLO, VINCENT and others. German decontamination plow (entgiftungs-pflug). (CWS 40th Chemical Lab Co Captured Material Tech Rept 55) Mar 1945. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a description of a German plow. It is designed to turn the earth in opposite directions in a path about one meter wide. Photographs of the plow are included.

PB 27007. PARK, CHARLES F. Report on investigation of raw materials used in German iron and steel industry. (JIDA Rept 26). Jul 1945. 123 p. Price: Microfilm-$3.00 - Photostat-$9.00

This investigation covers a number of German iron and steel plants visited and reports are made on location, facilities, raw material used, equipment, and production. Many production tables are included. The following plants were visited: (1) Krupp steel works at Rheinhausen; (2) Bochumer Verein steel works, (3) Wulfrath limestone quarries, (4) Škoda steel works, (5) Krupp steel works at Essen, (6) Schlaggenwald tin-tungsten mine, (7) Hermann Göring works, (8) Rammelsberg lead-zinc mine, (9) Grund lead-silver mine, (10) Klockner steel works and Hoesch steel works. Reports on Krupp steel works at Essen and Hermann Göring works are not included. These are being prepared by the CIOS secretariat in London and were not yet available when this report was forwarded to Washington.

PB 25102. PAXTON, PETTY, ed. Cromadur and tinidur special heat-resisting steels. (BIOS Halstead Exploiting Centre Rept 186) n. d. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
This report is a translation of a German standard sheet of material issued under orders of the Reichsstelle Eisen und Metalle, and relating to smelting, production processes and uses of steel. Specifications are given in tables. Appendix III and several pages of the report are missing.

PB 25668. PERRICOSTE, W. B. C. Production of beryllium, "Degussa". (BIOS Final Rept 319 Item 21) Nov 1945. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
A detailed account of the method for producing metallic beryllium as practiced at the "Degussa" plant, the Deutsche Gold- und Silber-Scheide Anstalt plant at Frankfurt. The process is carried out essentially in two phases: first, the preparation of pure anhydrous beryllium chloride using the mineral beryl as the ore; and second, the electrolytic production of beryllium, which is about 99% pure.

PB 27315. RANDALL, W. F. and FOSTER, E. M. Manufacture and application of specialized magnetic materials generally (including notes on other alloys requiring similar manufacturing technique). (BIOS Final Rept 8, Item 21) Jul 1945. 99 p. Price: Microfilm-$2.00 - Photostat-$7.00
The main objects of the visits were to examine developments in magnetic materials, improvement in manufacturing methods, and the application of such materials in Germany. Other alloys produced by specialized metallurgical operations and used in electronics were investigated from the same points of view. A detailed report is given on Herraeus-Vacuumschmelze A. G., Hanau, with complete factory specifications (in German) of the various alloys produced, including graphs, manufacturing data, tables, and curves. Notes on the following alloys are given: Isoperm; Sendust; Trafoperm, 36% nickel iron; Mumetal; and others.

PB 17380. SCHOLZ. Grundlagen des roheisen-sünderverfahren - (Anlage 5 z. sitzung am 29.2.44). (Basic principles of the raw iron-cinder layer process - (Supplement 5 to the meeting on Feb 29, 1944). (MIS 70a 20 7000419). Feb 1944. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
The text describes the G. Messer-H. Steffe RI-process. Starting material is a special raw iron containing about 4% of carbon and little silicon. It may be obtained by increasing the carbon content of unalloyed filings in a rotatory drum oven lined with basic materials. Figure 2 illustrates the atomizing equipment in which the raw iron is submitted to compressed air at 1380°C. During this process the iron droplets are oxidised and thus covered with a cinder layer. At the same time slight decarbonisation occurs. The carbon oxide developed in the fluid raw iron inflates the iron droplets into hollow spheres. The next step is annealing above 900°C. Various graphs illustrate special properties arising from further treatment. This process is one of the Firma Mannesmann. For document reporting the entire meeting, see PB 17391 under Germany. Reichsminister für Rüstung und Kriegsproduktion. In German.

PB 25271. SCHULZ, E. and WASSERMANN, G. Constitution and stress corrosion of the aluminum-zinc-magnesium alloys. (BIOS Halstead Exploiting Centre Rept 3758). Aug 1940. 23 p. Price: Microfilm-50¢ - Photostat-$2.00
A brief resume of research work in Germany on the aluminum-zinc-magnesium alloys is given in this English translation of a report of the Metallgesellschaft A.G., Technisches Sekretariat Metall-Laboratorium. References are included on this earlier research. This report discusses microscopical and X-ray investigations into the precipitation processes occurring in ternary aluminum-zinc-magnesium alloys. Photomicrographs showed that the precipitates were most rapidly produced by alloys containing the lowest proportion of zinc. The results of experiments made to determine the influence of different amounts of zinc and of magnesium in these alloys and of the effect of various heat treatments on stress corrosion are discussed in detail. It was concluded that by using a suitable proportion of these metals in the alloys, by the addition of manganese, and by special heat treatment, the stress susceptibility of the aluminum-zinc-magnesium alloys may be greatly decreased, and was hoped that further experimentation would lead to the development of a valuable new group of wrought aluminum alloys, which would be capable of being age hardened. Diagrams, plotted curves, and photomicrographs are included.

PB 25664. SHEPPARD, H. and others. The extruded brass rod industry in Germany. (BIOS Final Rept 386 Item 21) Nov-Dec 1945. 66 p. Price: Microfilm-$2.00 - Photostat-$5.00
This report covers an investigation of the following German factories: Osnabrücker Kupfer- und Drahtwerke, Osnabrück; Metallwerke Gustav Hesecker, Rohrenlisburg, Westfalia; Vereinigte Deutsche Metallwerke-Halbzeugwerke, G.m.b.H., Altena; V.D.M., Werdohl; Eduard Hueck, K. G., Lüdenscheid; Westfalia Kupfer-und Messingwerke, Lüdenscheid; Deutsche Delta-Metall-Gesellschaft, Alexander Dick & Co., Düsseldorf-Gräfenburg; V.D.M., Heddernheim; Robert Bosch, Stuttgart; Kreidler's Metall- und Drahtwerke, G.m.b.H., Stuttgart; William Prym, Stolberg; Dürener Metallwerke A., G., Düren; Felten und Guilleaume Carlswerke A. G., Köln; and Hachethal Draht- und Kabelwerke A. G., Hannover. Generally it was found that the output of brass rod had gradually declined during the war years, being replaced with aluminum alloys and zinc alloys. Layouts of some factories, and diagrams are included, as well as statistical data on production and names of office personnel.

PB 27379. TYLER, PAUL M. Highlights of German iron and steel production technology. (FIAT Final Rept 755). Apr 1946. 113 p. Price: Microfilm-$3.00 - Photostat-$8.00
This survey of the process metallurgy of the German iron and steel industry during World War II is based on interviews with German officials and metallurgists, personal visits to selected plants, and a partial review of reports of other American and British investigators supplemented by the study of numerous unpublished documents and a limited search of published literature. The report contains a discussion of the economic background of the German iron and steel industry, details of pig iron manufacture, raw steel manufacture, and the alloy steel situation. Tables present statistics of production. Four appendices are included, being translations of German articles on metallurgical processes and a comparison of German and American costs.

PB 23216. WIKLE, HUGH H. and STEINER, WALTER A. Survey of the carbon and graphite electrode industry of Germany. Technical bulletins and photographs of Demag Elektrostahl, G.m.b.H., Duisburg, Germany, supplement to FIAT Final Rept 397, PB 1339. (For other supplement, see PB 23219) May 1946. 21 p. Price: Microfilm-50¢ - Photostat-$2.00
This is supplement to PB 1339, page 208 of this bibliography. It contains two technical bulletins in English from Demag Elektrostahl G.m.b.H., Duisburg, Germany, describing the electric arc furnace in the iron foundry and in the steel foundry respectively. The bulletins are illustrated and contain capacity and operating data. The furnaces are top charged, having a swinging or movable superstructure and can be supplied with basket charging. There are also included two shop photographs, one showing a furnace with movable superstructure, and the other showing a furnace with movable shell.

PB 17367. WIRTSCHAFTSGRUPPE METALLINDUSTRIE, BERLIN. Patents and new registrations. (MIS 68b22 7000125). March 1946. 64 p. Price: Microfilm-$1.00 - Photostat-$4.00
This is a list of patents selected from the German patent gazettes of Sep 23, 1943-Dec 30, 1943 intended as confidential information for the subscribers of the journal "Metallschau". In German.

PB 18196. ZINKERZEUGUNGSSTELLE G.M.B.H., BERLIN. Technical data on zinc and zinc alloys. (MIS VII 70b 7002755 and 7001541) 1939-1942. 27 p. Price: Microfilm-50¢ - Photostat-$2.00
This consists of a set of tables giving compositions of zinc, various zinc alloys, and zinc scrap, and instructions as to their uses. In German.

Japanese

PB 23615. FOX and others. Tohoku Imperial University Metallurgical Institute, Sendai, Japan: Laboratory inspection report. Feb 1946. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
The inspection of the laboratory named in the title disclosed a number of interesting products which had been worked out. Among them were: (1) new materials for magnets, magnetic shields, and supersonic oscillators made without nickel; (2) a material called "alfer", composition Al 13% -16%, Fe 84% - 87%, which could as a substitute for high magnetic permeability materials; (3) a process called "centrifugal metallurgy" for the production of metals; (4) a Mg-Hg alloy which could be rolled and bent; (5) "Sendust" composition, 85% Fe, 9.5% Si, and 5.5% Al, which could be used in powder metallurgy and to make high frequency transformers; (6) three high nickel steels, "Nimicle", "Nimicle-C" and "Nicomacle" which showed indications of being acid resisting.

PB 23602 and 23603. SUPREME COMMANDER FOR THE ALLIED POWERS. STATISTICS AND RESEARCH DIVISION. The aluminum industry of Japan: Part I. The raw aluminum industry. (Special rept 9), and Appendix, Inventory of machinery (Special rept 9A) Apr 1946. 36 p. and 38 p. Price, each: Microfilm-50¢ - Photostat-$3.00
Report No. 9(PB 23602) is a detailed survey of the aluminum industry in Japan in which the data are given under the following headings: Analysis of past production; special war efforts; critical survey of the industry; the industry lost to Japan (plants in Korea and Manchuria); the raw material situation; the factor of location; and conclusions. Twenty tables give information regarding production; location and capacity of plants; imports of bauxite, aluminous shale, pitch coke, petrol coke and fluorspar; production of fluorine compounds; desired aluminum production and distribution; and requirements for cooking and household utensils. Report No. 9A (PB 23603) contains the appendix to Part I of this report, and consists of tables giving inventories of machinery for each of nineteen plants. These tables show the name, type, size, capacity, manufacturer, and date of manufacture of the machinery and the number of units.

United States

PB 25403. BOWMAN, H. L. Test of welded specimens of aluminum alloy E303-T315. Aug 1944. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report relates to a series of tests of welded specimens of aluminum alloy E303-T315 performed at the Drexel Institute of Technology. It had been suggested that the material be used for balk for a new floating bridge. Such use would involve the joining of extrusions by welding along (or near) the neutral axis and the question arose as to the effect of the weld on the alloy. Coupons were cut from the welded pieces and tested for ultimate strength. By comparison with the ultimate strength of the parent metal, the welded specimens had strengths of from 43.7 to 38.4 percent of the ultimate. Correspondence regarding arrangements for the experiments is given, including a letter from the Reynolds Metals Company stating that the welding process severely damages the material's resistance to corrosion and advising against welding this material in applications where high strength and good resistance to corrosive attack are required. Tabulated results of the tests, stress-strain curves and photographs of the specimens are included.

PB 27093. HESS, W. F. and others. Aircraft welding research: The spot welding of high tensile carbon and low alloy steels, NE 8715, NE 8630, and SAE 4340 in the 0.125-inch thickness. Progress report. (OPRD Res Rept W-212-A). May 1945. 35 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report describes work done in establishing optimum conditions for making tempered spot welds in three different type steels in the 0.125" thickness. It is shown that great improvements in the mechanical properties of the welds are obtained through tempering in the welding machine. The greater the hardenability of the steel, the more will the mechanical properties be improved. This process makes it possible to spot weld steels which would be unweldable using conventional methods of spot welding. Photomacrographs, photomicrographs, charts, tables, and a bibliography are included in this report of work conducted in the welding laboratories of the Rensselaer Polytechnic Institute.

PB 27097. HESS, W. F. and NIPPES, E. F. Electric resistance brazing of structural aluminum alloys: Electric resistance bonding of low melting alloys electroplated and sprayed on structural aluminum alloy surfaces. Final report. (OPRD Res Rept W-214). Sep 1945. 31 p. Price: Microfilm-$1.00 - Photostat-$3.00
All electrobrazed joints, using indium, tin, zinc, cadmium, 91% tin - 9% zinc solder and 60% zinc - 40% cadmium solder, were so weak and so brittle as to be unsatisfactory for producing high strength joints in structural aluminum alloys. Such joints must be strengthened by spot or seam welding. Little difference in shear strength was observed with surfaces properly coated by electroplating or by metal spraying. Unless the sprayed metal deposit was firmly adhered, no satisfactory electrobrazed bond could be made. Adherent metal sprayed coatings of the low melting metals and alloys on the smooth surfaces of structural aluminum alloys can be produced by preheating. Two types of adherent deposits were observed for tin and the two solders. At low preheat temperatures the deposit was rough whereas at slightly higher temperatures the deposit became smooth. Indium definitely lowered the shear strength of electrobrazed aluminum spot welds. Tin and the 91% tin - 9% zinc solder somewhat lowered the strength, while cadmium, zinc, and the 60% zinc - 40% cadmium solder somewhat raised the strength of electrobrazed joints. Intermittent seam welding, in which the wheel stops during and for a short interval after welding, was essential for the production of mechanically sound electrobrazed joints. Although the sealing of lap joints in structural aluminum alloys is possible, the process was deemed infeasible because of the brittleness of the resulting bond. Photographs, graphs, and a bibliography complete this report of work conducted at the welding laboratories at the Rensselaer Polytechnic Institute.

PB 27092. HESS, W. F. and WINSOR, F. J. The flash welding of aluminum alloys: Preliminary investigation using 75 Kva motor driven cam-operated flash welder. Final report. (OPRD Res Rept W-211). Sep 1945. 35 p. Price: Microfilm-$1.00 - Photostat-$3.00
A preliminary investigation of the flash welding of aluminum alloys conducted in the Welding Laboratories of the Rensselaer Polytechnic Institute is reported. The most important and most critical variable in the process was found to be the timing of the current cut-off with respect to upset. Best results were obtained when the current cut-off and upset occurred simultaneously. The amount of upset travel required to produce satisfactory welds was found to be important but not critical when held within the approximate limits 0.090- to 0.175-inch. An upset travel of 0.125-inch was considered optimum. Cams providing flashing travels of 0.422-inch and 0.265-inch respectively, produced satisfactory welds, although the shorter flashing travel permitted a considerable saving

in the amount of material burned away during flashing. It was found that the distribution of power during flashing as recorded by a high speed strip chart wattmeter could serve as an indication of the suitability of a particular cam contour for flash welding. It also indicated whether current flow continued during upset. Tables, charts, and photographs are included.

PB 27094. ESS, W. F. and others. The spot welding of high tensile carbon and low alloy steels, NE 8715, NE 8630, and SAE 4340 in the 0.062-inch thickness. Final report. (CMD Res Rept W-212) Sep 1945. 20 p. Price: Microfilm-$1.00 - Photostat-$2.00
This is the second and final report on a program established to supply data on the making of tempered spot welds in a variety of different steels in several gages. This report describes the development of optimum welding conditions for the spot welding and tempering of three different type steels in the 0.062" thickness. The fundamental principles for making tempered spot welds have been quite well established and a considerable body of data have been obtained for a variety of steels in the 0.040" and 0.125" thickness in previous investigations. The results obtained in this investigation of spot welds in representative steels (NE 8715, NE 8630 and SAE 4340) of 0.062" thickness are in agreement with previous work which showed that the improvement in mechanical properties by tempering the weld increased with greater hardenability. The technique of making tempered spot welds consists of allowing sufficient cooling time after passing the weld current to allow the weld to quench to the martensite forming temperature and then tempering this brittle martensite structure by means of a postheat of short duration. Such a postheat should reheat the weld to just below the austenitizing temperature to insure optimum toughness of weld structure. Graphs and tables are included. This work was done under contract by the Welding Laboratories of the Rensselaer Polytechnic Institute.

PB 27181. KOEHLER, JAMES S. and SEITZ, FREDERICK. On the propagation of the plastic deformation produced by an expanding cylinder. (NDRC Armor and Ordnance Rept A-139; CMD Rept 1214). Jan 1943. 30 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report deals with the deformation produced in a plate which is thick enough so that the plate does not get appreciably thicker near a hole produced by an expanding cylinder. Such deformation is similar to that produced during armor penetration by a shell. In the first part of the report the relations between the stresses and the strains are considered and the wave equations which govern the motion of the material when it is rapidly deformed are derived. It is found that in the case of the thick plate an elastic wave diverges radially from the expanding cylinder, that this is followed by a plastic wave, and that the elastic and plastic wave velocities do not differ very much. In the second portion of the paper an approximate expression for the displacement is obtained for the case where the deformation is elastic. In the last section a method of numerically integrating the wave equations is given. The method is applied to a particular numerical example, and the displacement and the shearing strain produced by a uniformly expanding cylinder are calculated and plotted at various times during the expansion. The calculation show that the shearing strain in both the elastic and the plastic regions increases as we go towards smaller radii. A discontinuity in the shearing strain is found at the boundary between the elastic and plastic regions. The calculation indicates that the compressibility and the density play an important role in determining the magnitude of the stresses developed in a thick plate. A program for further investigation is suggested.

PB 23118. KYLE, P. E. Utilization of secondary aluminum - uses and practices. Advisory report, Sep 11, 1944. (War Metallurgy Committee Res Rept W-145) Oct 1944. 31 p. Price: Microfilm-$1.00 - Photostat-$6.00
The technical phases of the problems involved in the production and utilization of secondary aluminum alloys are discussed in this report. The report is based on a study of the various specification limits for aluminum alloys; the origin of scrap from which secondary alloys are made; the practices used in the United States, Great Britain and Germany; the nature of the alloys produced; and the experiences of several years of the most common secondary alloys. Included are a bibliography and tables showing aluminum alloy specifications; production of secondary aluminum ingot and consumption of scrap; primary ingot and hardener by smelters for 1943; receipts of scrap and ingot by smelters; cast and wrought aluminum alloy shipments by all smelters and ingot sales by Alcoa and Reynolds; aluminum consumption for October 1943; type of remelted scrap or secondary ingot to be stockpiled by Metals Reserve Company; British, German and Japanese specifications; analysis and some properties of some Japanese plane parts; and substitution chart, aluminum casting alloys.

PB 25688. LAMBE, W. B. Pilot furnace for the decomposition of ammonium sulphate: Part II - Experimental investigation to determine the effect of steam on the electrical characteristics of the ammonium sulphate decomposition furnaces for the 50 ton alumina plant. Final report, Nov 1 - Dec 31, 1943. (War Metallurgy Committee Res Rept W-85) Feb 1944. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
Previous work on this project had established the power transformer characteristics for supplying energy to the ammonium sulphate decomposition furnaces which will be installed in the experimental alumina plant being designed and erected by the Chemical Construction Corporation. Earlier research had demonstrated that the use of superheated steam in the furnace would improve the conversion and generally result in more efficient furnace operation. Accordingly, experimental runs were made with steam and the data obtained confirmed the desirability of using steam. It was further established that the introduction of steam did not materially affect the electrical characteristic of the furnace. Test data are included. This is a final report on work done under contract between the War Production Board and the Chemical Construction Corporation, with Blakeslee Barnes as joint author. For part I, see PB 25687, under Lof, E. A.

PB 25687. LOF, E. A. Pilot furnace for the decomposition of ammonium sulphate: Part I - Experimental investigation to determine the electrical characteristics of the ammonium sulphate decomposition furnaces for the 50 ton alumina plant. Final report, Sep 15 - Oct 31, 1943. (War Metallurgy Committee Res Rept W-71) Jan 1944. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
The object of these experiments was to carry out the ammonium sulfate decomposition on a sufficiently large scale from which data could be obtained on which to base the characteristics of the electric furnaces and the furnace transformers for the contemplated 50 ton clay-alumina plant. This involved a determination of capacity, operating voltage, electrode spacing, depth, and temperature of the molten bath. The experiments were carried out in the plant of the North American Cyanamid, Ltd., at Niagara Falls, Ontario. This final report was submitted by Blakeslee Barnes of the Chemical Construction Corporation under contract with the War Production Board. For Part II, see PB 25688, under Lambe, W. B. Photographs of furnace are included.

PB 23410. LUTHER, GEORGE G. and others. A review and summary of weldability testing low alloy high tensile steels. n.d. 71 p. Price: Microfilm-$1.00 - Photostat-$5.00
This report constitutes a review and summary of all the weldability tests that are considered by the authors as pertinent to ship hull construction. The specimen preparation, testing procedure and relative merits of twenty tests are considered either briefly or at length depending upon the degree of complexity of the test. Each was placed in one of the following three categories: (1) Direct tests for measuring weld ductility, (2) cracking tests, and (3) indirect tests for evaluating weldability. An attempt has been made to bring into sharper focus the more vital factors entering into the choice of specimen for a particular weldability determination, such as the consideration of testing temperature, degree of

constraint and rate of loading. Appended are discussions of the difficulties in defining the term "Weldability", and the theoretical considerations and terminology involved in using the bead weld in evaluating weldability. The report is highly illustrated by photographs, tables, charts, and graphs.

PB 27106. MCMASTER, R. C. and NEGOVICH, N. A. Spot-welding of heavier gauges of aluminum alloy: Part I. Instrumentation of the spotwelder and investigation of the spot-welding of 0.091 in.-0.091 in. 24S-T Alclad. Feb 1945. 93 p. Price: Microfilm-$2.00 - Photostat-$7.00
This report presents preliminary results of a study of the spotwelding of wire-brushed 0.091 in. 24S-T Alclad aluminum alloy sheet. Results are typical of those obtained for 0.080 to 0.125 in. sheets. A description is given of a toroid-integrator system used to measure welder secondary current without the loss in energy inherent in a manganin shunt system. A technique is presented for producing shound welds of 2900 lb shear strength in 0.091 in. material. Secondary currents of the order of 80 kiloamp were used to produce weld nuggets with a diameter equal to approximately four times the sheet thickness. Large tip radii were found advantageous. Weld tip force near 3000 lb., and forge tip force above 6500 lb. improved the strength consistency and widened the range conditions under which sound acceptable welds were produced. Single spot tension strengths were near 800 lb. A reasonable number of welds between tip cleanings was found to be from 15 to 30. Tip sticking proved to be a problem with the high secondary currents and welder tip forces. Numerous oscillograms, radiograms and graphs illustrate the text, and a bibliography is added to this report of work done at California Institute of Technology. For Parts II and III, see PB 27107 and PB 27108.

PB 27107. MCMASTER, R. C. and NEGOVICH, N. A. Spot-welding of heavier gauges of aluminum alloy: Part II. New portable instruments for rapid measurement of current and tip force in spotwelding machines. Apr 1945. 32 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report presents details of the design, construction, calibration, and method of using a new portable instrument for measuring welding current and tip force in spotwelding machines. Current and tip force are measured by means of a small unit combining a toroid and a strain gauge bridge. This unit may be slipped over the electrode holder of any spotwelder and clamped ready for use in a few minutes. It could be used in production with negligible time lost in the operation of the spotwelders. The simultaneous records of welding current and tip force obtained with this unit may be applied to either a cathode ray or magnetic oscillograph or both. With a long persistence tube in the cathode ray oscilloscope, the welder performance may be checked visually. The magnitude of welding current, the tip force, and the timing may be measured directly from the screen of the cathode ray oscillograph. Permanent records can be obtained at low cost by photographing the cathode ray tube screen with a 35 mm. camera. The consistency of operation of a spot-welder is very easily checked by making several successive welds and noting visually or in a photograph of the cathode ray tube screen the occurrence of any discrepancies in wave shape or timing. The cost of the slip-on unit with a cathode ray oscilloscope is much lower than that of the magnetic oscillograph frequently used for spotwelder instrumentation. This new instrumentation should have immediate wide application in the aircraft industry where new specifications require frequent oscillographic checking of welder performance in spotweld production. Diagrams and photographs are included in this report of work performed at the California Institute of Technology. For Parts I and III see PB 27106 and PB 27108.

PB 27108. MC MASTER, R. C. and NEGOVICH, N. A. Spot-welding of heavier gauges of aluminum alloy: Part III. The spotwelding of wire-brushed 24S-T Alclad aluminum alloy sheets in thickness from 0.081 in. to 0.125 in. inclusive. Apr 1945. 35 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report summarizes results of a study of the technique of spotwelding 24S-T Alclad aluminum alloy sheets of 0.081, 0.091, 0.102, and 0.125 in. thickness. The investigation was carried out with a press type condenser discharge aluminum spotwelder with a maximum capacitance of 7500 μf and a maximum tip force of 9000 lb. Curves and data are presented to show the influence of welding machine variables upon weld strength, geometry, and quality. Optimum welding techniques are indicated for the listed gauges. The maximum energy storage capacity (7500 μf at 3000 v) was found to be adequate to produce nuggets of diameter three times the sheet thickness in 0.156 in. 24S-T Alclad aluminum alloy. This energy could not produce a nugget in 0.188 in. material under any combination of welding machine settings. The maximum tip force of 9000 lb. was not adequate to produce crack-free weld nuggets in 0.125 in. or thicker sheets. For Parts I and II of this report of work done at the California Institute of Technology, see PB 27106-7.

PB 25397. MAINS, L. F. Test of heavy aluminum balk (61S-T). Nov 1944. 17 p. Price: Microfilm-$1.00 - Photostat-$2.00
A heavy nine inch by nine inch aluminum balk of alloy 61S-T was tested in the materials testing laboratory of the Drexel Institute of Technology. This member had been fabricated by The Allison Steel Manufacturing Company of Phoenix, Arizona. The following tests were made: (1) Beam test of balk; (2) tension test of welds; (3) shear test of welds; and (4) tension test of aluminum. This report describes the tests in detail and includes drawings, photographs, and graphs.

PB 23734. SHIFFMAN, M. and FRIEDMAN, B. Fitting a hyperbolic sine curve to creep data. (NDRC Applied Math Panel Note 9; New York Univ Applied Math Group Memo 32). Dec 1943. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This report demonstrates how to fit a hyperbolic sine curve to a set of experimental data. A least squares solution leads to a pair of transcendental equations. These are solved by iteration. An example is worked out which shows how closely this law fits the data taken from the Creep Data Book. A curve, mathematical tables and a bibliography of three items are included.

PB 27095. WIANT, R. A. and others. Aircraft spotwelding research: Investigation of the final rinsing operation in the chemical surface preparation of alclad 24S-T for spot welding. Progress report. (OPRD Res Rept W-213-A). Apr 1945. 31 p. Price: Microfilm-$1.00 - Photostat-$3.00
This progress report describes an investigation of the final rinsing operation in the chemical surface preparation of Alclad 24S-T sheet for spotwelding. The work was done under contract by the Rensselaer Polytechnic Institute. The investigation consisted essentially of a series of experiments to determine the effects of time, temperature, and composition of water in rinsing Alclad 24S-T. Results show that a reaction sometimes occurs between the surface of the metal and the final rinse water. The effect is to raise the contact resistance of the sheet, the resistance increasing rapidly with increasing time and water temperature. The remedies for this reaction are reduction in rinse time, water flow and temperature, and control of pH in extreme cases.

METEOROLOGY AND CLIMATOLOGY

PB 27675. BURRITT, EDMOND J. Enemy meteorological installations, vicinity of Heidelberg, Germany. (AAF Non-Tech Intelligence Rept E-20) Jun 1945. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
There are two meteorological stations in and near Heidelberg: one at the astronomical observatory on Königstuhl Mountain, and the other at the Lucius Beche Institut. Both are secondary reporting stations, and no items of unusual interest were found in them. Investigation was made of such meteorological research as has been conducted since September 1939 at the University of Heidelberg, and information concerning the following new developments was found: (1) a nebulae counter; (2) studies of ice electricity were made; (3) a new method of detecting infrared rays was developed; (4) photo-

graphs of the growth of fog particles were made; (5) information was received that a more accurate measurement of the ozone content of the atmosphere to about 30 kilometers had been made by sending a spectroscope aloft. These developments are discussed in the report.

PB 27869. KNEITEL, ARNOLD. Investigation of meteorological intelligence targets at Brunswick, Gütersloh, Hillerslaben, Travemünde, Vechta, and Wagenhoff. (AAF Non-Tech Intelligence Rept E-12) Jun 1945. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
The Vieweg and Son Publishing House at Brunswick is known principally for its printing of the Meteorologische Zeitschrift, the last copy of which was printed in August 1944. The weather instruments located at Gütersloh came from the 21st Weather Detachment, and were of a type usually found at weather stations. All of the radiosonde calibration units, receivers, radiosonde, batteries and accompanying parts, used by weather detachments at Hillerslaben were sent to Erlangen for further study and use. Although the research laboratory "E Stelle" located at Travemünde Privell was not interested primarily in meteorology, a fair number of weather instruments were found there, and are listed. No weather instruments were found at Vechta. Thirty barographs were found at the 202nd Enemy Material Depot at Wagenhoff, 10 km north of Oithorn, and sent to the instrument section at Erlangen.

PB 27871. KNEITEL, ARNOLD. Investigation of meteorological intelligence target at Husum. (AAF Non-Tech Intelligence Rept E-13) Jun 1945. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
The meteorologists at Husum maintain a three-fold weather service. The most important of these is the Long Range Forecasting Section under the supervision of Dr. Wageman. A relatively small Short Range Forecasting Section is conducted by Dr. Collman, and is used in connection with a Maritime Section at Forschungstelle, Westküste, Husum, which gives tidal wave information to the Maritime Service. At the Hamburg headquarters this section handled all the long range forecasting for the Deutsche Seewarte, the Luftwaffe, and the Merchant Marine. These forecasts were issued every two days, with a period ranging from 5-10 days. However, these forecasts were of a general nature and gave periodical trends of the weather primarily. The only weather element on which extensive research has been undertaken for long range forecasting was pressures; i. e., the movement and development of pressure systems. The two methods now employed for this prognostication, the mathematical and the physical, are described.

ORDNANCE AND ACCESSORIES

British

PB 25710. GIBSON, W. H. Charcoal in explosive compositions. (BIOS Halstead Exploiting Centre Rept 10654) Apr 1946. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00
With the introduction of cordite as the British propellant, gunpowder was superseded as the main propulsive charge, and only continued in use in subsidiary but important applications, such as use in igniters or combustion time fuses, for which the requirement was small. Up to that time, owing to the increasing size and power of ordnance, there had been considerable development of modified types of gunpowder in which not only the size and form was changed but in which the nature of the charcoal was also altered. Details of the process of carbonisation, when various kinds of charcoal woods were being tried for the effect on gunpowder as a propellant for guns of large caliber, are scanty. The work which led to the introduction of Prism brown powder and N.I.E. powder is outlined, and the points which appear of interest at the present time are discussed. The whole question of charcoal in explosive compositions is reviewed chronologically from 1414 A.D. to the present.

German

PB 25096. ABELS, MAX. Cartridge cases of nitrated paper. (BIOS Halstead Exploiting Centre Rept 5474) Dec 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
An easily ignited and burned nitrated paper case was formed from cellulose paper rolled and stuck together with inflammable glue. This nitrated paper sleeve was used for the recoilless automatic gun M.K. 115, and was later taken over for use in the 3 cm single shot gun S.G. 116. Problems arising through the use of nitrated papers are discussed in this document translated from the German.

PB 25285. BARANSKI, GERHARD. Internal ballistics. II. Chapter of the handbook of machine arms, techn. part. (BIOS Halstead Exploiting Centre Rept 163) May 1946. 108 p. Price: Microfilm-$1.80 - Photostat-$8.00
In this English translation of a chapter of a handbook of the Rheinmetall Borsig firm of Germany, the subject of internal ballistics is discussed in detail under the following headings: (1) The cartridge (fixed ammunition); (2) the inside constitution of the gun-barrel; (3) the propellant charge, its chemical and physical qualities, velocity and pressure of combustion, form of the powder, the charge temperature, choice of powder, and admixtures for damping the muzzle-flash and for preventing coppering; (4) the ignition installation; (5) thermodynamic and internal ballistics, including the most important law of gas, special alterations of the condition, transfer of the gas-laws to internal ballistics, the constants of powder, the chief problems of internal ballistics, some approximation methods, and the method of Heydenreich; (6) calculations from barrel data; (7) the movement of the projectile in the gun-barrel; (8) the strains; (9) relationships in the worn-out barrel; and (10) conical gun-barrels. Numerous tables, plotted curves, and diagrams are included.

PB 27386. BRINKMANN, KURT. Proximity fuse employing an infrared sensitive detector. (BIOS Halstead Exploiting Centre Rept 5414). Aug 1945. 18 p. Price: Microfilm-$1.00 - Photostat-$2.00
This is the translation of two reports by German Engineer Kurt Brinkmann of the Reichspost Research Institute. It gives a brief description of the theoretical considerations on which the development of an infrared fuse was based, describes briefly the test models and their characteristics, and discusses the elimination of disturbing effects, the limiting range, employment of the fuses in daytime, and the results of preliminary flight tests. Graphs and graphic illustrations are included.

PB 25125. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Behaviour of collapsible tail-fins of "Minen-granaten" immediately after leaving muzzle. (Halstead Exploiting Centre Rept 250) n. d. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
Photographs of mortar bombs were taken immediately after leaving the muzzle, by setting up a Zeiss-Ikon slow motion camera at the side of the mortar at a distance of about twenty-five meters. In spite of the relatively unfavorable photographic conditions which existed at the time of the tests, the photographs gave conclusive results. It was shown that the tail fins performed certain fluttering movements and the twist of the projectile was to a large extent determined. A series of these pictures accompany the text. This is a translated report of experimental work in Germany.

PB 25198. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Calculation of the trajectory of the 7.9 mm s.S. fired from M.G. 34. (Halstead Exploiting Centre Rept 41) Jul 1938. 43 p. Price: Microfilm-50¢ - Photostat-$3.00
This is an English translation of a German report dealing with calculations of trajectories and further investigation of the s.S.-projectile for different heights of targets, ranges, and velocities of targets. It contains a number of tables and detailed calculations of eleven problems with a summary of notations used.

PB 25700. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE
Data concerning A.A. weapons. (Halstead Exploiting Centre 5309) n.d. 13 p. Price: Microfilm - $1.00 - Photostat - $1.00
Tabulated data concerning a large number of German anti-aircraft weapons is given in this report. The information includes: Length of gun and barrel; weights of weapon, barrel, and ammunition; rate of fire; method of loading; muzzle velocity (m/s); and life of gun barrel (number of rounds). A table shows weights of materials required for the 3.7 cm. A.A. m-42 gun. Similar tables for the 28 cms Duka with mobile mounting for coastal use, give in addition the manufacturing time in hours and per kilogram of weight.

PB 25143. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE.
Description of the 2 cm. gas operated machine gun. System Schwarzlose. LFA - 44 designed at LFA. (Halstead Exploiting Centre Rept 167) n.d. 9 p. Price: Microfilm - 50¢ - Photostat - $1.00
This is an English translation of a German description of a modified machine gun known as the Schwarzlose system. A new muzzle which is in effect a muzzle-brake operates on the kinetic energy of the propellant gas streaming out of the muzzle which is applied to move the locking parts. The muzzle brake can take three forms of construction as shown in five attached sectional sketches. The system is already known by a Swedish patent and a Swiss patent No 225185. The construction and functions are described in detail including four sketches of the breech mechanism. Only preliminary experiments had been carried out on the weapon at the time of the occupation

PB 25136. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE.
Duesenkanone. (Halstead Exploiting Centre Rept 373) n. d. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
To meet the demand for light weight guns which are essential for special purposes, the German army authorities developed recoilless devices before the war. On first consideration such devices were considered for use by airborne troops. At a later stage, however, it was thought advisable to use such recoilless devices with greater caliber in aircraft production. These so-called light devices were also intended for, and were partially introduced into, other branches of the forces (e. g. mountain artillery, fast moving units, naval speed crafts, etc.). This report gives brief data on the calculations for such a recoilless gun, the 8.8 cm. DUKA; also brief description of other similar guns developed. Two drawings of the 8.8 cm. gun, one with side escapes and the other with rear escape are included.

PB 25197. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE.
D W M, German Weapon and Ammunition Factories Limited Co., Research Institute. FIAT-report No. 42. Probabilities of hitting for M-projectile FF (supplement to FIAT-report No. 39). (Halstead Exploiting Centre Rept 40) Jun 1941. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
This is an English translation of a German report. Supplementary to the probabilities of hitting, mentioned in the German FIAT-report 39 for the MG 151 and MG-FF with high-explosive shells, the probabilities of hitting for the M-shell FF are stated, taking into consideration the fact that the weapon and target are moving, that the weapon can be at different flying heights, and that the line of sight, according to circumstances, makes a large angle relative to the horizontal. The report contains tables and graphs.

PB 26208. BRITISH INTELLIGENCE OBJECTIVE SUB-COMMITTEE.
Examination of the process of release of the segmental safety device in the A.Z. 1 type of fuse. (Halstead Exploiting Centre Rept 241) n. d. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
The purpose of the work covered by this report (a translation from the German) was to ascertain the duration of the opening process in the segment system of fuse AZ 1 at various speeds of revolution. The fuse has a device which allows the first segment to be released only after reaching the desired speed of rotation. Procedures and findings are described. The results are recorded on the individual pages of slow motion photographs which comprise most of the report, and are also collated in tabular form.

PB 25073. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE.
Minutes of the meeting at Messrs. Reinsdorf on 28. 10. 44; re: Pot (Schmetzendosen) Mine 4691 of Nipolit with new friction fuse type F and the following. (Halstead Exploiting Centre Rept 1936) Oct 1944. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
The firm has developed three different samples of pot mines, two in the shape of a box and one built on the inertia pellet shearing pin principle. A brief description of each type is given.

PB 25050. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE.
Mortar bombs. (Halstead Exploiting Centre Rept 176) Oct 1944. 43 p. Price: Microfilm - 50¢ - Photostat - $3.00
This report contains circular letters, memoranda and instructions to manufacturers of the 8 cm mortar bomb 34 in Germany, regarding painting of the bombs, the turning over of unserviceable bombs without vanes for special purposes of the Luftwaffe, manufacturing procedures, inspection, delivery, acceptance, control of manufacture, testing, packing and storing. Minutes of a meeting, held January 16, 1944, of the Mortar Bomb Working Committee, sub-committee East, of which W. Simmat was the chairman, are included. These contain data on the quantity contracted for and proposed deliveries of plants in Wels, Vienna, Rohrbach, Villach, Salzburg, and Stein in Oberkrain.

PB 25701. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE
Muck's report on electric gun. (Halstead Exploiting Centre 205) Aug 1943. 29 p. Price: Microfilm - $1.00 - Photostat - $2.00
Detailed description of an electric gun proposed by Otto Muck which he designed especially for the destruction of London from St. Omar in France, is given in this English translation of a number of memoranda from Herr Muck and high German ordnance officials. The inventor claimed that this electric gun could fire, without flash or detonation, 12 streamlined shells per minute at a range of over 250 km with a muzzle velocity of 1640 m/s. The gun was to operate through the use of magnetic fields of very great strength, 140,000 to 200,000 lines of force per cm^2, produced by means of a fly wheel generator. The criticism of those who investigated this proposed gun were that the designer started with several incorrect hypotheses in regard to the effect of rockets, that the development involved excessive technical demands, that the estimate of efficiency was too high, and the estimated fuel consumption per month of 54,000 tons of coal, was too low. Drawings are included.

PB 25099. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE.
The multi stage rocket. (Halstead Exploiting Centre Rept 648) Nov 1944. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This photographic reproduction of a German document contains: A photograph of rocket explosive shell 4831 on the Muller projector; a sectional drawing of the shell; graphs showing the propulsion of the trajectory, the velocities over the propulsion, and trajectory for the range of 160 km; construction of the unit for shorter ranges; manufacture of the shell; and further developments. Both German and the English translation are given.

PB 25317. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE.
Service instructions for the use of the machine to measure cartridge cases - model 514 H. (Halstead Exploiting Centre Rept 10228) n. d. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This is an English translation of a German instruction booklet covering operations and maintenance of a measuring machine for cartridge cases made by POLTE, Magdeburg, Germany. If a cartridge is defective and the sliding measure therefore covers a longer or shorter distance an ejector will adjust itself and automatically throw out the defective cartridge case. A similar mechanism works at each of the measuring positions. Included are a photograph of the machine and two drawings.

PB 25124. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Slow-motion camera investigation of the behaviour of bundle projectiles directly after: 1. The guide parts drop off, 2. Behaviour at the beginning of its trajectory, 3. Determination of velocity of projectiles. (Halstead Exploiting Centre Rept 251) Sep 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
The behavior of cluster projectiles immediately after leaving the muzzle of a gun was studied by means of photographs made with a high speed camera set up at one side of the gun in such a way that it covered about 12 meters of the trajectory close to the muzzle. The cluster projectile consisted of 3 or 14 arrow projectiles held together by guides of four different shapes. In order to make a measurement of the initial velocity a stretch of 8 meters was measured off by measuring rods. The photographs were taken at the rate of about 2000 pictures per second. A series of 58 photographs shows the release of the guide parts, and the flight of the projectiles. This is a translation of a German report of the National Institute for Films and Pictures, Department for Technical Research Films.

PB 25058. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Tables giving data about automatic weapons in service or being developed: Calibres 13 mm - 5.5 cm. (Halstead Exploiting Centre Rept 726) n. d. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This translated table gives data on thirty-nine German automatic weapons under the main headings: Parallel developments; automatic weapons 13 mm. to 5.5 cm. in service or under development; status August 1, 1944; and notes.

PB 25071. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Tables of sizes and compositions of German propellants. (Halstead Exploiting Centre Rept 1883) Sep 1945. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
This translated report consists of tables giving the dimensions, names of manufacturing firms and factories, and composition of the following German propellants: Diglycol flake powder - 10, 5-; Digl. Bg. P. -10,5-; Digl.R.P. -C -; Gu. R.P. ;Digl.R.P. -8,2-, - 8,5 -;Digl.R. P. - K O D -.
The report was compiled at Reinsdorf, Germany.

PB 25179. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Weapons SG 117 to SG 119, 3 cm. barrel breech block. (Halstead Exploiting Centre Rept 155) n. d. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
The demand for greater density of fire and the method of automatic release by photoelectric cell or by similar automatic release devices made the development of a multi-barrelled aircraft weapon necessary. The most favorable performance was achieved with a cluster of seven barrels. With such an arrangement the vibration per barrel is not excessive. The weapons had a wall thickness of 5 mm. made of extruded tubing. At the point of the highest gas pressure, the barrels were held together with a sheet metal band of 5 mm. thickness and the space between the tubes were filled with concrete. The breech block consisting of a metal disc is screwed to the band. The ignition leads are brought through the locking disc separately and connected to the switch mechanism. The operation of weapons SG 117 and SG 118 which are seven-barrelled and were mounted in aircraft is described. The SG 119 is a cluster of 7 x 7 tubes, altogether 49 tubes, which are mounted on a common breechlock. This weapon was specially used as a "shrapnel" weapon built for mounting in high speed aircraft. Further description is included in this report which was translated into English from the German.

PB 25716. BUSCHER, tr. Investigations into spin and twist of rifling. (BIOS Halstead Exploiting Centre Rept 790) Jul 1944. 95 p. Price: Microfilm-$2.00 - Photostat-$7.00
Investigations were made into the twist of projectiles of various ogive shapes and various lengths to make possible the determination of the stability figure of a projectile or of the final twist required for a projectile. Diagrams containing the values $\left(\frac{k}{\lambda}\right)^2$. σ in relation to the velocity, will serve for determining the stability figure σ of a projectile. The final twist required for a projectile is to be found from the diagrams in this report translated from the German.

PB 27063. DEN HARTOG, J. P. and others. German torpedo targets in France. (CIOS File XIII-3, 3, 4, Item 11) Jan 1945. 22 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report is primarily concerned with German aircraft torpedo equipment located in southern France. The Paris area has been a source of numerous U-boat torpedoes, which are discussed. A new bomb-torpedo discussed, suggests that the Germans may abandon the use of standard aircraft-launched engine-propelled torpedoes. If a suitable sight and releasing mechanism can be produced by the Germans, a weapon more lethal than the aircraft torpedoes heretofore employed by the Allies or the enemy may emerge. The decreased cost and time of production, the increased charge/weight ratio, and the reduced risk to the attacking aircraft compared to the manufacture and use of the standard torpedo are salient factors favoring its adoption. Specimens of the aircraft torpedo, recovered in the Mediterranean area were sent to the United Kingdom and to the United States for further examination. Photographs illustrate the report.

PB 27065. DENARO, L. F. German research and development in tank armour welding. (CIOS File XXXIII-10, Item 18) Nov 1945. 56 p. Price: Microfilm-$2.00 - Photostat-$4.00
The development of welded armor in Germany has been followed with interest, information being obtained from hulls and turrets of enemy tanks and armored cars captured in the field. This report on German research and development of tank armor welding gives a brief historical review of German armor welding and covers the following topics: Austenitic welding of armor, soft mild steel electrodes for welding armor, German ferritic armor welding electrodes, comparison between German and British armor welding electrodes, hydrogen in electrode coatings, austenitic weld metal compositions, and hot cracking in austenitic weld metal. Three appendices, sketches, tables, and photographs are included.

PB 28312. DINGER, ERICH. Non-rotating projectiles for signal pistols. (BIOS Halstead Exploiting Centre Rept 19, Part 7). Feb 1943. 21 p. Price: Microfilm-50¢ - Photostat-$2.00
A brief report of two special types of projectiles which are fired from a signal pistol with subsonic velocity is given in this English translation of a German paper. One of a small fin-stabilized projectile corresponding to the calibre of the signal pistol so that it could be fired like a regular cartridge and the other a reconstruction of a hand grenade so that it could be fired a longer distance by hand from a signal pistol. Detailed description of the cartridge projectile 326 LP with small HE body is given. Difficulties in obtaining satisfactory flight were met in adapting the hand grenades to firing from the signal pistols. A description of projectile 361 LP, with large HE body, is given. A dis- with a copy of the original document published by the German Academy for Aeronautical Research which contains photographs and drawings. This paper was one of a number given at a conference on nonrotating projectiles in February 1943.

PB 26712. DREWELL, PAUL. Method for the actuation of an event by a projectile moving with supersonic velocity. (BIOS Halstead Exploiting Centre Rept 10115) Dec 1939. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is an English translation of a German patent application dated Dec. 28, 1939. In ballistic investigations the requirement frequently arises to set in action, at a certain point in its trajectory of a moving projectile a particular event, for example, the functioning of a spark gap. The use of wired screens or of plates, by which an electrical current circuit is made or broken when the shot passes through, an-

tails the risk that the transit of the shot may cause a damage in its velocity and direction of motion, so that no other measurement later in the trajectory is possible. This invention is concerned with a method which, while utilizing the head-wave, gives an actuation almost entirely free from inaccuracy, even for very unstable trajectories. The method is described in detail. The lines of figure 1 shows the plane problem, Figure 2 shows the condenser potential in relation to the time of flight of the shot, and in figures 3 and 4 are shown the circuit-diagrams of two lay-outs as example of the application of this invention.

PB 25264. EINERT, tr. Changing barrels and liners in heavy naval coastal guns of the German navy. (BIOS Halstead Exploiting Centre Rept 5330) Aug 1944. 23 p. Price: Microfilm-50¢ - Photostat-$2.00
The English translation of a manual of the High Command of the German Navy gives a brief survey of the construction of barrels and linings of heavy naval coastal guns (caliber 20.3 cm. to 40.6 cm.) with concrete emplacement mounting, coastal turntable mounting and turntable mounting (former battleship turrets). Instructions on measures to be prepared, the most suitable working methods, and the use of equipment such as cranes, are presented for the use of managers of artillery arsenals or naval shipyards in charge of the installation of new barrels or liners. This report contains lists showing the types of guns and mountings in the various batteries. A table giving weights of barrels and cradles and drawings of various barrels are included.

PB 25100. ERB, GEORGE OTTO. On the development of armour-piercing ammunition and its corresponding electric fuses. (BIOS Halstead Exploiting Centre Rept 182) May 1945. 23 p. Price: Microfilm-50¢ - Photostat-$2.00
Numerous diagrams illustrate this translated German discussion of short-time-igniting and the construction of armor-piercing ammunition with short-time igniters. There is a brief discussion of the development of armor-piercing rocket shells, using short-time igniters.

PB 25080. GAILWITZ. Notation of gas pressures in internal ballistics. (BIOS Halstead Exploiting Centre Rept 840) Jan 1942. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translated order or circular letter from the Ordnance Office Testing Department, Berlin, stating that the notations and conceptions of gas pressures in internal ballistics had hitherto been devoid of uniformity, which had led to difficulties in correspondence and conversation. Definitions are given for the following expressions: Maximum gas pressure, designed gas pressure, greatest permissable gas pressure, exceptional gas pressure, normal gas pressure, average gas pressure, and muzzle gas pressure. A number of incorrect notations are pointed out.

PB 25316. GAILWITZ. Principles for the device of proper charges with various guns. (BIOS Halstead Exploiting Centre Rept 841) n. d. 39 p. Price: Microfilm-50¢ - Photostat-$3.00
This is an English translation of a German report in which the following topics are discussed: (1) The geometrical shape of propellant charge; (2) the primer charges and the base charges; (3) quick and slow burning propellants; (4) types of propellant compositions in use; (5) high or low calorific propellant; (6) highest permissible density of the charge; (7) efficiency resulting from boring out the chamber; (8) heat of combustion and the initial velocity as a means of increasing efficiency; (9) on increasing the power by means of bottle-shaped cartridge cases or screw-breech mechanisms; (10) utilization and evaluation; (11) muzzle gas pressure and the variation of muzzle velocity; (12) tamping; (13) abnormal gas pressure; (14) muzzle flash and flash escaping from muzzle; and (15) blowbacks.

PB 25175. GARRETT. (tr.) Developing of the centering device for K - projectile. (BIOS Halstead Exploiting Centre Rept 187) n. d. 84 p. Price: Microfilm-$1.00 - Photostat-$6.00
This is a comprehensive survey of the research that the Firma Rheinmetall-Borsig have carried out on the development of the hollow centering device for the K-projectile. The investigated centering device is shown on an actual plan sheet. The force-distance diagrams were produced by static deformation in a tensile machine, and photograph of the deformed and sectioned Koerper are attached. A previous German document, BN-Bericht 370, summarizes experiments made up to mid-1942.

PB 25066. HABERSANG. Notes on conference in Berlin on 6.1.45 regarding flash ammunition 8.8 cm, stating successful use of percussion fuzes. (BIOS Halstead Exploiting Centre Rept 906) Jan 1945. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a very brief report of a conference on the use of impact fuzes for A.A up to 5.5 cm. caliber. Trials with the 8.8 cm. in Rerik showed an astonishing superiority for shell with impact fuzes as against those with time fuzes

PB 25061. HABERSANG. Notes on discussion in Berlin on 30.1.45 comparing UZ and AZ firings with reference to probability of hitting. (BIOS Halstead Exploiting Centre Rept 903) Feb 1945. 30 p. Price: Microfilm-50¢ - Photostat-$1.00
These are notes by Herr Habersang, of Krupps, on comparism of hitting an airplane with shell having clockwork and impact fuzes. He discusses the trial tests made in Rerik, the object of which was the attack against a Flying Fortress at a height of 7,500 meters, where the superiority of the impact fuze was shown. As a temporary solution for the calibers 8.8 cm. and 10.5 cm. the clock work double fuze was approved. For others, all clockwork fuzes were to be provided with percussion action.

PB 25680. HARRASCHKA, tr. Firing with dipole-shells. (BIOS Halstead Exploiting Centre Rept 704) Dec 1944. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is an English translation of a letter to German naval authorities transmitting the result of an artillery firing test with dipole-shells. The purpose of the test was to show with what accuracy a point of burst could be laid at a certain distance and a certain angular height (vertical visual angle if anti-aircraft gunnery) when the initial velocity is known and the external ballistic influences are considered. Data sheets giving the results of the tests are included.

PB 25064. HALLIN. Experiments with nitrate of ammonia compressed charges. (BIOS Halstead Exploiting Centre Rept 929) Dec 1944. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This is an English translation of a German document. Combustion experiments were made with lacquered compressed charges which had been stored for some time in a pill-box, in order to find out how the absorption of moisture during the prolonged storage affected the ballistic data. Satisfactory results were obtained. The charges were evidently for the propulsion of jet equipment or rockets. In order to determine whether the compressed charges change their properties in transit, a combustion test was made. This produced a perfectly normal diagram. See also PB 25065.

PB 25065. HALLIN. Trials with 15 cm tubular charges of ammonsalpeterpulver in turbines having jets 6.1 mm; previous trials in September had failed owing to explosions. (BIOS Halstead Exploiting Centre Rept 931) Jan 1946. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
This is an English translation of a German report on experiments made in November 1944 with 15 cm. compressed charges made of nitrate of ammonia powder for built-up barrels. The charges were evidently for the propulsion of jet equipment or rockets. Combustion tests were carried out with the charge buried in the ground, on a thrust measuring and on a twist measuring apparatus. Four charges were lacquered and

stored for six days after manufacture and then put to a weight test. All showed considerable increase in weight, as is shown in tabular form in this report. In all tests the combustion was considered good. A tabulated summary of the results of the tests is included. See PB 28064 for a later report.

PB 28694. HARMSEN, tr. Report on trajectory measurements of the 21 CM aircraft rocket (H. E.) (Fired from the aircraft). (BIOS Halstead Exploiting Centre Rept 424) Nov 1944. 48 p. Price: Microfilm-$1.00 - Photostat-$4.00
Discussion and tabulation of results of firing trials to make measurements of the trajectory of the 21 cm. aircraft rocket (H. E.) when fired from an aircraft, are given in this English translation of a report of the Hermann Goering Institute for Aeronautical Research, Institute for Theoretical Ballistics. Tables showing setting values, speed of approaching flight and altitude of flight; mean meteorological data; times measured by an oscillograph, and velocities; diagrams of trajectories; and also a diagram of wiring circuits for the transmission of the time intervals are included. The photo-measurement of the trajectory and of the distance covered by the aircraft was carried out by means of a Zeiss far-angle photo-theodolite station C 7. The recording of the time intervals was performed by means of a Siemens-loop oscillograph.

PB 25809. HAUKE. Guiding principles for firing proof of H.E. shells (nose fuze) and nose fuse (with ballistic cap). (BIOS Halstead Exploiting Centre Rept 1008) n.d. 16 p. Price: Microfilm - 50¢ - Photostat - $2.00
This report, translated from the German presents guiding principles for fireproofing of H.E. shells, intended for service use only. Tables of measurements of various H.E. shells, and preliminary proof firing specifications are included.

PB 27480. HENSLEY, JAMES W. German 105 mm. smoke projectile, filled SO_3. (CWS 41st Chemical Lab Co Captured Materiel Tech Rept 22) Feb 1945. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 25137. HERRMANN, O. Erosion testing apparatus for material for jets and barrels (Apparatus 157). (BIOS Halstead Exploiting Centre Rept 375) n. d. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
A sectional drawing shows the design of this apparatus. It consists of a pressure chamber in which a certain quantity of powder is burnt and from which the powder gases can escape through a jet of any desired diameter. The rear portion of the barrel contains the breech-block and the firing chamber for the 3.7 cm. PAK shell. The knee joint contains the hole for reception of the forward barrel and the arrangement for measuring gas pressure, also in the interior are two holes intersecting each other at an angle as a continuation of the combustion chamber. In the forward barrel is the space for the firing jet and the screw ring shown in a second drawing. For sealing off, a sealing ring is built in. A detailed description of a test made with this apparatus is given together with evaluation of the experiment. The report is translated from the German.

PB 25074. HERMS, tr. Muzzle flash. (BIOS Halstead Exploiting Centre Rept 2131) n. d. 31 p. Price: Microfilm-50¢ - Photostat-$3.00
This report, translated from the German, records German research from before 1902 on the elimination of muzzle flash on firing. Except for potassium salts and sodium oxalate no compound had been found which would decrease the muzzle flash. At the time of this report work was still in progress.

PB 27742. HILGE, tr. Summary of the anti-aircraft developments. (BIOS Halstead Exploiting Centre Rept 600) n. d. 56 p. Price: Microfilm-$2.00 - Photostat-$4.00
This English translation of a German summary gives description, barrel specification, ballistic data, and ammunition data for the following anti-aircraft guns: 12.8 cm. flak 40 and flak 40 turn gun, 12.8 cm. flak 45 and flak 45 twin gun, 10.5 cm. flak 39 gun, 8.8 cm. flak 41, 15 cm. flak 65, 12.8 flak 40 K. (conical), 5.5 cm. machine gun 115, 8.8 cm. flak 36/41 and flak 37/41, 24 cm. flak 85, 8.8 flak 18, flak 36, and flak 37, and 8.8 cm. (Ducks) recoilless gun.

PB 25286. HOLT, H. von. Interrogation report of Dr. Ing. H. Von Holt regarding his 8 inventions. (BIOS Halstead Exploiting Centre Rept 8771) Jan 1946. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
The eight inventions briefly described in this English translation of a German report are given below. (1) P-method for guns, a firing method used on the light-anti-tank weapon called the "Pupchen," by which method it was possible to reduce considerably the ratio of the maximum gas pressure to the mean pressure in the gun barrel and thus use guns and projectiles of lighter construction and attain higher rate of fire. These advantages were obtained in the P-equipment by an approximated constant pressure diagram within the gun barrel, determined by the special make-up of the propellant charge and by the construction of the projectile. (2) Recoil-less P-principle. By employing a special charge fitted in behind the P-projectile, working without a combustion chamber, the recoil which arose on the former P-equipment was practically eliminated. (3) Combustion chamber economization for rockets fired from thick-walled tubes. (4) Small arms ammunition without cartridge cases. (5) Three cm. rocket for use against low flying aircraft. (6) 12,000 kg. powder propellant (drive, propulsion) for a remote controlled bomb. (7) Brake-rockets to make possible the landing of gliders on pre-selected points or for the quick braking of larger aircraft or ordinary land vehicles. (8) Development of low pressure propellant charges without the use of raw materials needed for smokeless powder or high explosives.

PB 25070. HOLT, (DR.) VON. Work by "WASAG" in connection with recoilless guns. (BIOS Halstead Exploiting Centre Rept 1193) Feb 1942. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
This report consists of notes on a discussion with Dr. Redlich at Reinsdorf, Germany in November 1940 on recoilless guns. As a charge, trench mortar powder Ngl. Pl. P. 73.5 x 0.8 was the most satisfactory at the time of the discussion, the firing pressure being 2000 - 3000 atmospheres. In the latest developments at that time, the jet was closed with a hardwood disc to obtain a better performance. WASAG was asked to supply a fast burning powder to replace the hard wood disc, which would be very strong under static pressure and could at the same time supply additional energy. The difficulties of these requirements and alternative measures are discussed. A report on the successful firing trials when fast burning disks of powder were used is included.

PB 25180. KLEIN, HEINRICH. A comparison of all known methods of increasing the range of artillery, including subcalibration and rocket assistance. (BIOS Halstead Exploiting Centre Rept 164) n. d. 43 p. Price: Microfilm-50¢ - Photostat-$3.00
This is a comprehensive survey of the methods of improving performance in guns by Dr. Heinrich Klein, of Rheinmetall Borsig, A.G., which has been translated into English. The following topics are among those discussed: The advantages and possibilities of improving performance; methods for increasing the muzzle velocity; limiting muzzle velocity and questions of barrel life; the advantages of super-caliber-barrels relative to barrel life; the external ballistic basis for shell and gun construction for the heavy A.A. gun with super-caliber barrel; examples of the construction of various types of guns and shell, such as discarding sabot shell, the Littlejohn shell, the sub-caliber arrow shell, shell with auxiliary rocket propulsion, and rifled and coned barrels; and comparison of construction and performance of

the various types of shell. It was concluded that a M.V. of 1500 m/s represents the limit of improvement unless a great advance in propellants is reached and the damaging temperature of the explosion can be compensated or overcome. Discussion is included of the possibilities of increased performance and longer ranges by normal shell, by multi-charge rocket (step rockets); and the step rocket fired from a gun. Drawings and plotted curves illustrate this report.

PB 25715. KOERSTER, HANS. Report on experience re: Development of ammunition of the ammunition development department of Bochumer Verein für Gusstahl-Fabrikation A. G. (Niedersachsen A. G., ABTLG. Spange). (BIOS Halstead Exploiting Centre Rept 5802) Sep 1945. 136 p. $3.00 - Photostat-$10.00
This translated report describes the work carried on by the ammunition development department of Bochumer Verein für Gusstahl-Fabrikation A. G. on: Flak projectiles; projectiles for Army artillery, mortars, and naval coastal artillery; and driving bands for artillery projectiles, rockets, and a/c bombs. A discussion of work on ballistics and special developments with hollow charge bombs and special aircraft with hollow charge explosive charges is included with diagrams and tables.

PB 25219. KRAMER, MAX. Remote controlled dive bombs. (AAF ATSC T-2 Translation F-TS-551-RE) Mar 1946. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
A survey of the development of the controllable dive bomb of 3307.5 lb gross weight known as the "Fritz X" by the combined efforts of several German agencies, is given in the introduction of this report. The remainder of the report is limited essentially to the development of sighting methods and to the aerodynamics and radio control systems of this development in which fields the Deutsche Versuchsanstalt für Luftfahrt had an active part. Methods of sighting in the control of this bomb are described, leading to simplification of the task of the bombardier and better accuracy. The design of the "Fritz X" in 1939 and in 1942 is compared and the results of test flights are given. This is an English translation of an address by the author and is followed by a short discussion. Photographs, drawings and plotted curves are included.

PB 27476. LEVINE, MELVIN L. German FE 41 pΔ elf Fe canister. (CWS 41st Chemical Lab Co Captured Materiel Tech Rept 8) Sep 1944. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27477. LEVINE, MELVIN L. German FE 42 canister. (CWS 41st Chemical Lab Co Captured Materiel Tech Rept 9) Sep 1944. 16 p. Price: Microfilm-$1.00 - Photostat-$2.00

PB 12476. LORENZ (C.) A. G. Mine. German patent application L107599XI65e applied Aug 22, 1942. Apr 22, 1942. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
Drawing and correspondence on subject included.

PB 27867. McDONALD, GEORGE C. and DETWEILER, A. H. Institute for Research on Weapons, (Luftfahrtforschungsanstalt) (C.I.O.S. target No. 25/71). (AAF Tech Intelligence Rept E-7) Jun 1945. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
A brief survey of the activities of the three departments of this institution in Germany is given in this report. The department for mechanical and electrical researches on weapons (internal ballistics) reported research on various weapons. No details are given. The department of exterior ballistics has two firing test tunnels one of 400 meters underground and one of 30 meters. The equipment for supplying various air pressures and for photographing trajectories is described. The most important barrels and projectiles tested in these tunnels are listed. The third department of this institution is for research on sighting arrangements for shooting and for bomb dropping. Its activities are also outlined.

PB 25328. MARKS, F., tr. Armour piercing rifle grenade (I): Establishment of velocity of projectile and spin during an observation of the trajectory up to 6 m in front of the muzzle. (BIOS Halstead Exploiting Centre Rept 268) Dec 1944. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
By means of a high speed camera, photographs were taken of the trajectory of a newly developed armor piercing rifle grenade up to 6 meters in front of the muzzle. Projectiles from the discharger cup and projectiles from the Panzerschreck were tested. The photographs and graphs showing the velocity of the projectile are included in this translation of a German document.

PB 25696. MARKS, F. (TR.) Device for automatic weapons to prevent double loading. (BIOS Halstead Exploiting Centre Rept 5941) Mar 1942. 7 p. Price: Microfilm - $1.00 - Photostat - $1.00
A device for machine guns is described herein which prevents a further cartridge being loaded as long as there is a cartridge case in the barrel. The characteristic feature of the device is that a sensitive lever is incorporated in the breech by means of which the catch bolt in the breech runway is actuated if a cartridge case remains stuck in the barrel, but if the cartridge is ejected properly, the lever is kept inoperative by the cartridge case. Further description of this device is given in this English translation of a German patent taken out by Mauser Werke A.G. of Oberndorf, Neckar, Germany, May 10, 1938. A page of drawings is included.

PB 25126. MARKS, F., tr. Investigation of rotation of the arrowshell PPG. 10.5 cm. (BIOS Halstead Exploiting Centre Rept 255) Nov 1945. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
The object of the investigation presented in this English translation of a report of the German Government Institute for Films and Pictures, Technical Research Film Department, May 28, 1943, was to determine the spin or twist of the projectile and to show the release of the base of the cartridge base and supporting rings, by means of photographs taken with a Zeiss high speed camera. Since the horizontal markings on the projectiles had been worn off by handling and were no longer white, they could not be seen in the photographs and the spin could not be ascertained. The release of the cartridge case base and supporting rings could be seen clearly, however. A series of ten photographs are included.

PB 25123. MARKS, F., tr. Investigation of smoke clouds with the 15.5 cm K-418 (f) and various projectiles and propellent charges. (BIOS Halstead Exploiting Centre Rept 253) Jun 1943. 18 p. Price: Microfilm-50¢ Photostat-$2.00
The process and time taken to complete combustion when firing a 15.5 cm K-418 (f) with three different projectiles and propellent charges was studied by means of photographs taken with a slow-motion camera. It was a question of determining what quantity of the propellent gases leave the barrel before the projectile, from which conclusions might be drawn in regard to obturation between the barrel and projectile. Information was also needed regarding how far combustion of the gases occurs after leaving the barrel, as it appeared desirable to keep the muzzle flash as small as possible. Three series of photographs showing the gas clouds and the projectiles in flight are included. This is a translated report of the National Institute for Films and Pictures, Department for Technical Research Films, of Hillersleben-Sud, Germany.

PB 25207. MARKS, F., tr. Investigation of the motion of the LFH 18/40 half-track mounting on firing. (BIOS Halstead Exploiting Centre Rept 259) Jan 1946. 23 p. Price: Microfilm-50¢ - Photostat-$2.00
With the assistance of a Zeiss-Ikon rapid camera a study was made of the motions of a LFH 18/40 gun mounted on a tractor and the motions of the tractor itself during the discharge. Photographs constitute the major part of this translation of a German document.

PB 25273. MARKS, F., tr. New developments in fuzes not yet in production. (BIOS Halstead Exploiting Centre Rept 5458) Sep 1945. 68 p. Price: Microfilm-$1.00 - Photostat-$5.00
Descriptions of a number of newly developed fuzes and their operation are given in this English translation of German reports on the subject. The following developments are discussed: Fuzes with protuding tappets for use against Dural sheet 1-2 mm.; universal time fuzes; simplified 3.7 cm. and S. D. fuze for rotatory projectiles; super fuze mechanisms; S. D. fuses for projectiles without rotation and low muzzle pressure; mortar shell impact fuzes with firing safety device (IW 263); fuse setting by the comparison method; time fuze with electric setting in barrel; releasing fuze for B bombs; liquid pressure fuzes; electric percussion fuze; remote ignition of anti-aircraft projectiles; electrostatic fuses; and eddy current fuzes. Included also are descriptions of a tachograph for measuring the revolutions per minute of a projectile and an apparatus for measuring the number of revolutions of the 3.7 cm. fuze, 20. Numerous drawings are included.

PB 27392. MARKS, F., tr. Shooting with 10.5 cm U.K.P. 39/39 projectiles. (BIOS Halstead Exploiting Centre Rept 256) Sep 1943. 14 p. Price: Microfilm-$1.00 - Photostat-$1.00
Motion pictures were taken in order to show the behavior of the German type 10.5 cm. U.K.P. projectiles (sub-caliber-arrow) shortly after leaving the muzzle of a gun. The gun (10.5 cm. Flak) was fired without quadrant elevation against a wooden target set up at a distance of about 120 meters. Seven rounds were fired. Series of photographs are included for four of these rounds. These pictures show the detachment of the driving bands, the release of the tracers and the trajectories of the projectiles. This is an English translation of a report of the Reichsanstalt für Film und Bild Abt. Technischer Forschungsfilm.

PB 25679. NIEMANN, RUDOLF. Patent number 717312, gun mount suspension. (BIOS Halstead Exploiting Centre Rept 5943) Jan 1942. 6 p. Price: Microfilm - $1.00 - Photostat - $1.00
This is an English translation of a German patent granted to Mauserwerke A.G. covering a gun mount suspension. It is a supplement to patent No 708250. The object of the invention is to eliminate the principal cause which may lead to variations in movement between the gun and the mount. The invention is based on the knowledge that in the first round of a burst of sustained fire the impulse of motion is greater than in succeeding rounds and consequently the means adopted to nullify the force or absorb the shock must be stronger during the first round and weaker for the succeeding ones. The invention is described in detail. One diagram illustrates the knowledge on which the invention is based by means of a timetravel curve, and another diagram shows an example of the invention.

PB 27465. PANARIELLO, VINCENT and others. German "blue ring" chemical bomb (KC 50 II Bu). (CWS 40th Chemical Lab Co Captured Material Tech Rept 64) Apr 1945. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
This bomb could be used as follows: (1) As a chemical harassing agent causing sneezing, vomiting and systemic effects; (2) preceding a chemical attack by a non-persistent or persistent casualty agent in order to cause the desired physiological effects that would make the continued use of the gas mask impossible. Photographs and diagram.

PB 27463. PANARIELLO, VINCENT and others. German "blue ring" chemical shell (15 cm. Gr. 19 blauring 1), (and appendix B, 10.5 cm. F. H. Gr. blauring, May 10, 1945; appendix C, 10.5 cm. F. H. Gr. 40 blauring 3, May 23, 1945). (CWS 40th Chemical Lab Co Captured Material Tech Rept 62) Apr 1945. 28 p. Price: Microfilm-$1.00 - Photostat-$2.00

PB 27455. PANARIELLO, VINCENT and others. German canister filter machine (VM-filter-blasmaschine). (CWS 40th Chemical Lab Co.Captured Material Tech Rept 54) Mar 1945. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a description of a machine for preparing the filter unit of a German gas mask. The gas mask canister is also described. Photographs of the machine and canister are included.

PB 27453. PANARIELLO, VINCENT and others. German civilian gas detection kits. (CWS 40th Chemical Lab Co Captured Material Tech Rept 52) Mar 1945. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27501. PANARIELLO, VINCENT and others. German civilian training incendiary (einheitsbrandsatz NTE 250). (CWS 40th Chemical Lab Co Captured Material Tech Rept 37) Jan 1945. 5 p. Price: Microfilm - $1.00 - Photostat - $1.00

PB 27497. PANARIELLO, VINCENT and others. German CO - F.B. 38 canister. (CWS 40th Chemical Lab Co Captured Material Tech Rept 33) Jan 1945. 22 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report describes a German gas mask canister designed to protect against CO. The canister will protect against CO in a concentration of 1% by volume in air flowing at the rate of 32 liter/min. for 9½ hrs.

PB 27499. PANARIELLO, VINCENT and others. German collective protector, Auer-luftschutzraumbelüfter NR 2,4. (CWS 40th Chemical Lab Co Captured Material Tech Rept 35) Jan 1945. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27511. PANARIELLO, VINCENT and others. German collective protector, 1.2 m^3/min. (Heinen & Co.). (CWS 40th Chemical Lab Co. Captured Material Tech Rept 47) Feb 1945. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00
This collective protector unit would be used, in the event of chemical warfare, to purify contaminated air for gas shelters. In case of power failure the unit could be manually operated. In the absence of chemical warfare, the unit could be operated as a ventilation unit. Photographs and a diagram are included.

PB 27503. PANARIELLO, VINCENT and others. German collective protector canister, GS 10. (CWS 40th Chemical Lab Co Captured Material Tech Rept 39) Feb 1945. 11 p. Price: Microfilm - $1.00 - Photostat - $1.00

PB 27504. PANARIELLO, VINCENT and others. German collective protector canisters S 0.6 and G 0.6. (CWS 40th Chemical Lab Co Captured Material Tech Rept 49) Feb 1945. 9 p. Price: Microfilm - $1.00 - Photostat - $1.00

PB 27489. PANARIELLO, VINCENT, and others. German distress signal torch, red-white-red (notsignalfackeln, rot-weiss-rot). (CWS 40th Chemical Lab Co Captured Material Tech Rept 25) Dec 1944. 10 p. Price: Microfilm - $1.00 - Photostat - $1.00

PB 27491. PANARIELLO, VINCENT and others. German distress smoke signal, red (K) (rauchnotzeichen, rot K) (CWS 40th Chemical Lab Co Captured Material Tech Rept 27) Dec 1944. 13 p. Price: Microfilm - $1.00 - Photostat - $1.00

PB 27507. PANARIELLO, VINCENT and others. German 15 cm. Gr. 19 Nb. (smoke) shell. (CWS 40th Chemical Lab Co. Captured Materiel Tech Rept 43) Feb 1945. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
The agent of the smoke filling used was oleum absorbed on pumice; it is not a particularly satisfactory smoke producing material. Photographs and diagram are included.

PB 27498. PANARIELLO, VINCENT and others. German-flash-reducer for light field Howitzer (Kart.-Vorl. d. le. F.H. 16/18). (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 54) Jan 1945. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27459. PANARIELLO, VINCENT and others. German gas mask facepiece. (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 58) Mar 1945. 8 p. Price: Microfilm - $1.00 - Photostat - $1.00

PB 27470. PANARIELLO, VINCENT and others. German "green ring" chemical rocket (15 cm. Wgr. 41 grünring 1). (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 69) May 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27468. PANARIELLO, VINCENT and others. German "green ring" chemical shell (10.5 cm. F. H. Gr. 38 grünring 1), (and appendix B, 15 cm. Gr. 38 grünring; appendix C, 10.5 cm. F. H. Gr. grünring). (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 67) May 1945. 21 p. Price: Microfilm-$1.00 - Photostat-$2.00
This shell could be used as a chemical casualty agent causing eye effects, blistering, lung effects and systemic effects in addition to its H. E. splintering effect. Photographs and diagrams.

PB 27471. PANARIELLO, VINCENT and others. German horse gaiters, model 39. (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 70) May 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27506. PANARIELLO, VINCENT and others. German 105 mm. F.H. Gr.Nb. (smoke) shell. (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 42) Feb 1945. 11 p. Price: Microfilm - $1.00 - Photostat - $1.00

PB 27456. PANARIELLO, VINCENT and others. German Nb Hgr 41 smoke grenade. (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 57) Mar 1945. 6 p. Price: Microfilm - $1.00 - Photostat - $1.00

PB 27486. PANARIELLO, VINCENT and others. German Nb KL 42 Sz smoke candle (black smoke). (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 11) May 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27508. PANARIELLO, VINCENT and others. German pyridine impregnated canisters: FE 41p △ clf, FE 42 p △ fcc, FE 42p △ hyd. (CWS 40th Chemical Lab Co. Captured Materiel Tech Rept 44) Feb 1945. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27492. PANARIELLO, VINCENT and others. German rifle smoke grenade, 42 (gewehr-blendgranate 42). (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 28) Jan 1945. 15 p. Price: Microfilm - $1.00 - Photostat - $1.00

PB 27457. PANARIELLO, VINCENT and others. German S-Filtereinsatz canister. (CWS 40th Chemical Lab Co. Captured Materiel Tech Rept 56) Mar 1945. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a description of a German civilian gas mask canister. Photographs of the components are included.

PB 27201. PANARIELLO, VINCENT and others. German single burst flamethrower 46. (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 34) Jun 1945. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
The single burst flamethrower 46 is a close combat weapon issued to Engineer assault troops as a supplementary weapon. Depending upon wind direction and velocity, a single burst of flame up to 30 meters length and 1-2 seconds duration can be ejected. In operative condition it weighs 2.9 kg. It is discarded after firing, collected later, cleaned and filled for reuse. A similar weapon is recommended for adoption by the U. S. Army. Photographs and a diagram are included.

PB 27500. PANARIELLO, VINCENT and others. German smoke egg grenade (Nb 42). (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 36) Jan 1945. 11 p. Price: Microfilm - $1.00 - Photostat - $1.00

PB 27454. PANARIELLO, VINCENT and others. German smoke pot, N. K. 28. (CWS 40th Chemical Lab Co. Captured Materiel Tech Rept 53) Mar 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27487. PANARIELLO, VINCENT and others. German spare parts kit for detector powder pump (ersatzsteile für spürpumpe). (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 20 Appendix B) Mar 1945. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27493. PANARIELLO, VINCENT and others. German 20 mm. shell, Mauser type, AP/I. (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 29) Jan 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27467. PANARIELLO, VINCENT and others. German "white ring" chemical shell (15 cm. Gr. 19 weissring), (and appendix B, 7.5 cm. Jgr 18 weissring; appendix C, 10.5 cm. F. H. Gr. weissring). (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 65) May 1945. 19 p. Price: Microfilm-$1.00 - Photostat-$2.00
This shell would be used as an H. E. shell causing casualties by fragmentation and blast and as a chemical harassing agent causing lachrymation. Photographs and diagrams.

PB 27469. PANARIELLO, VINCENT and others. German "yellow ring" chemical mortar shell (10 cm. Wgr. 35 Nb. St. gelbring). (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 68) May 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27466. PANARIELLO, VINCENT and others. German "yellow ring" chemical shell (15 cm. Gr. 19 gelbring), (and Appendix B, 10.5 cm. F. H. Gr. Nb. gelbring). (CWS 40th Chemical Lab Co Captured Materiel Tech Rept 66) May 1945. 14 p. Price: Microfilm-$1.00 - Photostat-$1.00
This shell could be used as a persistent casualty agent causing blistering, lung effects and systemic effects. Photographs and diagrams.

PB 25276. POPE, M.E., TR. The 5 cm. Paw (high-low pressure gun). (BIOS Halstead Exploiting Centre Rept 10143) n.d. 2 p. Price: Microfilm - 50¢ - Photostat - $1.00

The 8 cm. Pzw, a light anti-tank gun, was developed using the high-low pressure pump principle to meet the following requirements: 600 to 800 m. range; muzzle velocity of about 540 m/s; small shot weight; armor penetration performance of at least 140 mm; and minimum possible weight of propellant charge and dispersion rectangle of accuracy about 1 x 1 m. at 500 m. range. Diagrams are missing from this report translated from the German.

PB 25697. POPE., M. E., tr. The maximum temperature of the driving band of a projectile due to the friction between shot and bore. (BIOS Halstead Exploiting Centre Rept 4783) Jul 1944. 17 p. Price: Microfilm-$1.00 - Photostat-$2.00
This is an English translation of a report of Mauser-Werke A.G., Oberndorf am Neckar, Germany. In a previous report it had been assumed that the frictional heat produced was distributed equally, half to the shot and half to the bore. This does not correspond to the real circumstances, since the hot band is continually coming into contact with a cold part of the bore, and hence the bore will absorb more than half the frictional heat. In this report, the manner of distribution of the frictional heat is investigated more thoroughly and the temperatures that are generated are determined. The shot friction is also analyzed. Plotted curves are included.

PB 25742. REDLICH, D., tr. Determination of the velocity of a shell and investigation of the stability of the shell throwing mortar (rocket assisted shell) Marga. (BIOS Halstead Exploiting Centre Rept 280) Jun 1944. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
Slow motion photographs were taken of the Gustloff type and the Donauwörth type of the shell throwing mortar Marga. From these photographs, which are presented herein, the velocity of the shell up to about 6 meters in front of the muzzle was determined and shown by graphs. The stability of the gun when fired was ascertained by calculating the time motion curve of the recoil and of the jump of the muzzle. This document is a translation from the German original.

PB 25046. REDLICH, D., tr. High speed photographs of the explosion of a 3.7 cm flak C/36. (BIOS Halstead Exploiting Centre Rept 295). Oct 1943. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
This document contains photographs of a German automatic C/36 gun being demolished by means of an enclosed mine. The experiment was made to ascertain whether the newly constructed safety casing was sufficient to withstand flying fragments of the gun and so protect the crew. The photographs were taken from a slow motion film made by the State Establishment for Film and Illustration.

PB 25044. REDLICH, D., tr. Movement of the protective armour on the 12.8 cm A.A. 40 M during firing. (BIOS Halstead Exploiting Centre Rept 294) May 1944. 15 p. Price: Microfilm - 50¢ - Photostat - $1.00
The object of the investigation described in this English translation of a report of the State Establishment for Film and Illustration, Department Technical Research Film, in Germany, was to ascertain by means of slow motion pictures the vertical tipping movement of a protective shield fixed into a 12.8 cm. A.A. 40 M gun during firing. Detail description is given of the method of measuring the movement by photography is presented. Schematic diagrams and curves illustrate the movements. The curves seemed to indicate that there is no uniform center of motion.

PB 25045. REDLICH, D., tr. Release of rotating aerofoil to be used for dropping of supplies from an aircraft. (BIOS Halstead Exploiting Centre Rept 303) Aug 1942. 5 p. Price: Microfilm - 50¢ - Photostat - $1.00
Photographs were made with an Askania Z camera with a lens of f-500 mm and a built-in Mikrograph stop watch, of a loaded aerofoil dropped from an airplane. The aerofoil had a length of 1.5 - 2.5 m and was 20-30 cm wide. By examining the photographs the following facts were established: Total time of descent of aerofoil, time of descent up to the beginning of rotation of the aerofoil, and speed of rotation of the aerofoil. These results are given in a table. A series of photographs is included. This is an English translation of a report of State Establishment for Film and Illustration, Department for Technical Research Film, Germany.

PB 25127. REDLICH, D. R., tr. Tests of PPG "Knueppel" 24 CM and 28 CM, fired from barrels K 3 and K 5. (BIOS Halstead Exploiting Centre Rept 291) Aug 1943. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
Slow motion photography was used during the development and testing of PPG projectiles at Rügenwalde, in Germany. The methods used in making these photographs and discussion of the results are given in this English translation of a report of the State Establishment for Film and Illustration, Technical Research Film Department. The object of the investigation was to determine: (1) The general behavior of the projectile in the first part of its trajectory; (2) the behavior of the driving ring and the moment of its release from the projectile; (3) the intial speed of the projectile; and (4) the amount of twist. Examination of the pictures showed no somersaulting of the projectiles and that the driving rings dropped off as they should. The twist could be determined without difficulty in most cases. A table giving the gas pressure, velocity frequency exp/sec, and twist rotation, and many photographs are included.

PB 25240. RIECK. Investigation on the locking process in the MG 42 bolt. (BIOS Halstead Exploiting Centre Rept 242) Apr 1944. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
Irregularities in the process of firing the MG 42 gave rise to the suggestion that the rollers in the bolt assembly could spring for a short period and thus temporarily release the locking at the very moment when the process of firing required secure locking. Slow motion photographs were made of the firing process. The examination of the pictures showed no evidence of any springing back of the rollers. To make the photographs barrel extensions were made which permitted observation of the rollers through narrow filed slits. Other special photographic and illumination arrangements are described, and the results are discussed. Numerous photographs are included. This is an English translation of a German report.

PB 27743. RUDOLPH, tr. Investigation of specific impact energies of 1.3 cm., 2.0 cm. and 3.7 cm. A.P. projectiles fired against armour plate. (BIOS Halstead Exploiting Centre Rept 740) n. d. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
A theoretical discussion of the penetrative performance of armor piercing shells is given in this English translation of a report of Rheinmetall Borsig, A. G., Berlin-Tegel, May 5, 1937. Table 1 shows, for the calibers 1.3, 2, and 3.7 cm. shells, the specific impact-energies related to the cross section of the projectile which are essential in order to obtain "critical rounds" (50% penetrative performance) against armor plates of a 100 kg/mm^2 resistance with an angle of impact of 90°. Table 2 represents a survey on the critical limits obtained with the anti-tank gun for the Paulina Shot (wt. 148g.). It is pointed out that from a certain strength upwards, the power of resistance of the harder armor plate becomes less, due to the fact that the projectiles have to perform a smaller amount of deformation work in penetrating harder plates than in softer plates. Plotted curves are included.

PB 25076. SCHUMANN, ERICH and others. Dependence of explosive efficiency upon the nature and strength of the lining material in hollow explosive bodies. Part I: 90° - Cone at 20 mm height position. (BIOS Halstead Exploiting Centre Rept 2596). Mar 1943. 108 p. Price: Microfilm-$1.50 - Photostat-$8.00

The explosive efficiency of a lined hollow body is dependent upon the nature of the explosion, the shape of the hollow space, the nature and strength of the lining material, and the distance of the hollow explosive body from the material to be destroyed. Systematic investigations were made to ascertain the dependent relationship between explosive efficiency and the factors determining it with the object of producing a lined hollow body possessing ideal explosive efficiency. Among the lining materials tested were copper and copper alloys, deep draw sheet metals, zinc, sheet iron, aluminum and aluminum alloy, magnesium alloy and lead. Conclusive results are reported for TNT-filled bodies with 90°-cone as hollow space, with a 20 mm. distance between the explosive charge and the armor plate used as a target. Other tests using various thickness of lining materials and varying distances between charge and armor plate are reported. Numerous tables and diagrams are included showing the results of the explosions. This is an English translation of a German paper from the Physical Institute II of the University of Berlin and the Research Department of the Army Armaments Office.

PB 25075. SCHUMANN, ERICH and HEINRICHS, GERD. Information preliminary to report 43/2 on the increase of the effect of hollow explosive slabs caused by control of ignition (lenses). (BIOS Halstead Exploiting Centre Rept 2590) Mar 1943. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
Extensive experiments on explosions showed that the effect of the hollow explosive slab can be substantially increased, especially in the case of a hemispherical hollow space, by suitable control of the detonation wave. This shaping of the detonation wave, also called ignition control, makes it possible to influence within certain limits the shaping of the covering material. The most successful means of assisting this is the "lens." With the assistance of a "lens" made of nonexplosive material the detonation wave is forced to ignite the explosive in a circle and to advance in the explosive from this circle in "trumpet form" (annular type ignition). The results of explosions carried out on a tank turret about 60 cm. thick using slabs with and without lenses, showed that the holes made with explosive slabs with lenses were more than 25 percent deeper than those without lenses and were more conical in shape. The experiments are described in detail and the results discussed. This is an English translation of a report from the Physical Institute No. 2 of the University of Berlin. Photographs and diagrams are included.

PB 25194. SCHWARZ. Air firing tables for H.E./T round in M.G.FF (20 mm). (BIOS Halstead Exploiting Centre Rept 37) Oct 1939. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
The problems in preparing firing tables for firing from an airplane are discussed. There is a choice between several systems, that is, a system fixed relative to the aircraft, a system fixed relative to the earth, or a coordinate grid system fixed relative to the aircraft or to the earth. The advantages of these systems are compared and evaluated. Included are firing tables and firing table calculations for the high explosive shell FF, weight 134 g., aircraft velocity 100 m/s, height above ground 6000 m. and 60° angle of sight, at ranges from 100 to 1000 m. Other tables and drawings mentioned in the report are not included. This is an English translation of a report of the Deutsche Waffen- und Munitionsfabriken A.G., of Lübeck-Schlutup, Germany.

PB 25195. SCHWARZ. Calculations for trajectory of light shells 7.9 mm. (BIOS Halstead Exploiting Centre Rept 38) Oct 1945. 140 p. Price: Microfilm-$1.50 Photostat-$10.00
In this English translation of a report from Deutsche Waffen- und Munitionsfabriken A.G., the trajectories are calculated for four light shells, with weights of 5.6 g., and with muzzle velocities of 900 m/s. One had the same shape as s.S shells (light pointed), one the shape of an S shell (heavy pointed), one had a semi-spherical head, and one a cylindrical shape. The exterior ballistics of these shells were compared with those of the standard s.S. shell, with a weight of 12.8 grams and muzzle velocity of 755 m/s. Tabulated data and numerous trajectory curves are included.

PB 25167. SCHWARZ. External ballistics of 12.8 cm flak. (BIOS Halstead Exploiting Centre Rept 36) Jul 1944. 94 p. Price: Microfilm-$1.00 - Photostat-$7.00
Variations for the effect of initial velocity (V_0) and the density of air for 12.8 cm Flak 40 were ascertained and are presented in this translated report of the Deutsche Waffen- und Munitionsfabriken A.G. (DWM), Research Institute. The procedure and results are discussed. The trajectory coordinates for the V_0 influence are given in Table P 2517 and for air density in Table P 2700. Results are shown in plotted curves, which comprise the bulk of the report.

PB 25162. SCHWARZ. Probability of hitting; comparison of 6-10 and FF-D ammunition. (BIOS Halstead Exploiting Centre Rept 31) Feb 1938. 32 p. Price: Microfilm-50¢ - Photostat-$3.00
This consists of a theoretical discussion of the probabilities of hitting a target when using the above named ammunition, in which the following factors are among those considered: A target at a fixed distance from the weapon's muzzle, a movable target, the dispersion of the weapon, the angles of sight, calculated probabilities for various conditions, and probabilities when shooting from one aircraft to another. It was concluded that for equal dispersions the flatter trajectory is always superior to the less flat; and that when shooting within a rather large interval of ranges, the effect of a decrease of the 50 percent dispersion is for very flat trajectories opposite to that in the case of very sharply curved ones. Other conclusions are also presented. Tables showing the probabilities of hitting under various conditions are given, also plotted curves derived from this data. This is an English translation of a report of the Deutsche Waffen- und Munitionsfabriken A.G.

PB 25142. SCHWARZLOSE, WILHELM. Mass-locked breech mechanism for automatic guns (energy breech block). (BIOS Halstead Exploiting Centre Rept 166) Jul 1945. 6 p. Price: Microfilm - 50¢ - Photostat - $1.00
This is an English translation describing a German invention of a mass-locked breech for automatic guns, where the breech mechanism consists of a new design of two masses instead of one, of which the front one serves directly as an elastic support for the cartridge base while the rear mass transmits its energy to the front mass and thereby to the cartridge base by means of a very strong buffer spring. Therefore, the time of buffer action and the maximum pressure of the buffer spring are advantageously fitted to the time functions of the gas pressure. The action of this new mass-locked breech is described in details and illustrated by three sectional drawings. The function for the gas pressure and the approximately synchronous spring pressure are illustrated by two graphs.

PB 27057. SHEPHERD, R. V. Visit to Mauser-Werke A. G., Oberndorf am Neckar, and Mauser personnel at Lager Haining, Ötzal, near Innsbruck. (CIOS File XXXIII-4, Item 2) May 1945. 379 p. Price: Microfilm-$8.00 - Photostat-$26.00
The report covers visits to the Mauser weapons plant and interrogation of its personnel. Information on German development work of the recent past and of the future was obtained, including documents, reports, and experimental models. Recent developments concentrated on design of the simplest character for quick production. Progressive rifling and sand blasting of bores to reduce barrel wear were two investigational studies. Results of interrogation of personnel on weapon developments and design are given in considerable detail, together with a detailed listing of reports, minutes, drawings, and patent specifications obtained by the investigators. Another section describes the organization of the Mauser works. Numerous photographs, drawings, and diagrams are included.

PB 25021. SMITH, A., ed. Notes on the report Roechling, Saur, Geist of 4th September 1945 dealing with H. Roechling - projectile. (BIOS Halstead Exploiting Centre Rept 529) Sep 1945. 3 p. Price: Microfilm - 50¢ - Photostat - $1.00

The Roechling projectiles were of extreme length, between 12 and 20 calibers, and were stabilized by spring vanes in the sub- and supersonic sphere. A note of Albert Speer, German minister of munitions, states that in his opinion the Roechling projectile was one of the most advanced developments achieved in the munition line during the war, but that in spite of this, its use was prohibited by Adolf Hitler on May 3, 1943, as the results obtained by these missiles could be easily attained by other means. Two notes showing Hitler's interest in these projectiles are included. Memoranda included in this report give information regarding the development of this projectile and tests made with it against armor, concrete, earth and rock. Its use as an armor piercing projectile failed because it was not possible to reduce the angle sensitivity of the projectile sufficiently. Many difficulties occurred during the development, including those met in the development of a sabot to enable the fin stabilized sub caliber projectile to be fired from a rifled barrel.

PB 25238. SPALDING. Raising the performance of the MK 108 from 600 to 1200 rounds per minute. (BIOS Halstead Exploiting Centre Rept 5362) Aug 1945. 4 p.
Price: Microfilm-50¢ - Photostat-$1.00
This is a discussion of the problems involved in doubling the rate of firing of the MK 108 gun to give 1200 rounds per minute. The principle of a "blow back gun" which "fires during the run-out" allows extensive variations in the rate of firing in a simple manner by altering the weight of the breech block. The rate of firing per minute rises as the weight of the breech block decreases. A small weight for the breech block, however, results in an acceleration of the velocity of the breech block and an increase in its kinetic energy which involves a strengthening of the springs connected with the principal functions, i. e., the closing spring and the breech buffer spring. Experiences obtained with the MK 108 show that it is entirely feasible to raise the rate of firing to 1200 rounds per minute. However, there are a number of conditions which must be met and these must be confirmed by experiments. These conditions and experiments are described in this English translation of a report of the Rheinmetall-Borsig A. G., Werk Unterluss, dated Aug. 3, 1945.

PB 25090. SPALDING, WILHELM. Action of detonating explosive charges on gas pressure. (BIOS Halstead Exploiting Centre Rept 5329) Oct 1945. 18 p.
Price: Microfilm-50¢ - Photostat-$2.00
The history of an investigation which was carried out under the direction of the author in the WKW office of Rheinmetall-Borsig A. G., Berlin-Tegel, is given in this English translation. Descriptions are given of experiments on a method of measuring gas pressure in order to find a standard for different gas impact performance of various weights and shapes of explosives and of experiments made to find the relations between the gas pressure wave and the breaking point of light metal sheet. The results of the experiments and the mathematical equations involved are discussed. Diagrams and plotted curves are included.

PB 25278. TAUBERT. The burning of powder-rockets. (BIOS Halstead Exploiting Centre Rept 10251) n. d. 48 p. Price: Microfilm-50¢ - Photostat-$4.00
A powder rocket consists basically of a combustion chamber which also serves as the fuel container, and one or several nozzles. The rocket functions in such a way that the whole powder storage is ignited simultaneously. Between the gas, flowing through the nozzles, and the ignited charge, a state of equilibrium with a definite internal pressure exists under suitable working conditions. In this English translation of a German report, the laws for this state of equilibrium and the factors which influence it are discussed. In this connection, rockets without and with regulating devices are discussed, and equations are given for the different relations. A number of plotted curves are included.

PB 25275. TEICHMANN. Details on rocket propellant "Perpulver". Exact composition, viscosity, particle size of the ammonium-perchlorate, method of preparation, safety and sensitivity, elimination of included air, experience to date and forecast of developments on above points, summary. (BIOS Halstead Exploiting Centre Rept 10028) Feb 1946. 13 p. Price: Microfilm-50¢ - Photostat-$1.00
This report consists of an English translation of answers by Dr. Teichmann, of Wolfratshausen, Upper Bavaria, to a questionnaire regarding the rocket propellant "Perpulver". The composition of this is 80% ammonium perchlorate, 12% P. V. A. (polyvinylacetate), and 8% Buna S. Dr. Teichmann states that at the end of the war only a very short period of development of "Perpulver" had been carried out and the composition should not be considered as the final development. Comments are included in which the author points out tendencies leading towards the development of an ideal propellant. One of the advantages of "Perpulver" mentioned in this report is that it is completely consumed, even under low pressure, in combustion chambers, and in plane layers at the same speed as is achieved by galatinized propellants at higher pressures.

PB 27186. TOTH, STEPHEN J. and others. German "blue ring 2" chemical rocket (15 cm. Wgr. 41 wKb blauring 2). (CWS 46th Chemical Lab Co. Captured Materiel Tech Rept 56) Aug 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27194. TOTH, STEPHEN J. and others. German gas curtain (gasschutzvorhänge). (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 70) Sep 1945. 7 p.
Price: Microfilm-$1.00 - Photostat-$1.00

PB 27190. TOTH, STEPHEN J. and others. German "green ring yellow" chemical shell (10.5 cm. F. H. Gr. 38 grünringgelb). (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 47) Jul 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27193. TOTH, STEPHEN J. and others. German lacrimatory generator - small type (reizkerze). (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 71) Sep 1945. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27195. TOTH, STEPHEN J. and others. German 1 kg. incendiary grenade (brandstab). (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 69) Sep 1945. 7 p.
Price: Microfilm-$1.00 - Photostat-$1.00

PB 27188. TOTH, STEPHEN J. and others. German "one yellow ring" and "two yellow rings" chemical land mines (10 l. Sp. Bm 37) (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 54) Aug 1945. 15 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27187. TOTH, STEPHEN J. and others. German "one yellow ring" chemical bomb (KC 250 Gb). (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 55) Aug 1945. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27189. TOTH, STEPHEN J. and others. German "one yellow ring" chemical shell (15.0 cm. Gr. 39 gelbring). (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 48) July 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27488. U. S. CHEMICAL WARFARE SERVICE. 40TH CHEMICAL LABORATORY CO. German smoke apparatus (drum and cylinder). (Captured Materiel Tech Rept 22, Appendix B) Jan 1945. 4 p. Price: Microfilm - $1.00 - Photostat - $1.00
Four photographs are shown which illustrate various parts of the German smoke apparatus.

PB 25134. WANINGER. Aircraft guns MK. 101, 103, 108. (BIOS Halstead Exploiting Centre Rept 371) Jul 1945. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This is an English translation of a German article discussing aircraft guns. Installation of 3 cm. guns in fighter planes was proposed years ago because the explosive charge of a 2 cm. grenade did not suffice for causing vital damage to bombers. Until the end of 1944 it was overlooked that the muzzle velocity played a subordinate part because of the great amount of aircraft oscillation. A 3 cm. gun firing 1000 rounds per minute was developed by Mauser but could not be delivered before 1946. The article arrives at no conclusion.

PB 27535. WOLF. Automatic loading mechanism of the KwK 7.5 cm. (BIOS Halstead Exploiting Centre Rept 275) Oct 1944. 15 p. Price: Microfilm-$1.00 - Photostat-$1.00
The automatic loading mechanism of a KwK 7.5 cm. gun was to be examined by a slow motion camera in order to record possible stoppages. Part I covers this test which was made May 4, 1944 and includes nine photographs. A similar test was made Aug 11, 1944 on a newly completed KwK 7.5 cm. L24 in order to discover possible irregularities. This test is covered in Part II and includes ten photographs. The German text on all photographs is translated into English.

PB 25281. ZIPPEL, W., tr. Comment on FB4-report no. 17, ref.: Increase of efficiency of fire arms. (BIOS Halstead Exploiting Centre Rept 5303) Jun 1944. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
A discussion of the various factors involved in the increase of muzzle performance is discussed in this English translation of a German report. The increase of the muzzle velocity of the 7.5 cm. anti-tank guns especially was under consideration. It was shown that the barrel of this weapon was very short relative to the muzzle performance required. The example of this gun indicated that a reasonable utilization of powder required a corresponding length of gun barrel. Also the advantage of a foil charge would make itself felt more strongly in the case of a greater length of barrel.

Italian

PB 25078. HENDERSON and others. Weapon development. (BIOS Halstead Exploiting Centre Rept 3787). Sep 1945. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
A report of the interrogation of two former Italian prisoners of war regarding a weapon they developed and experimented with in secret during the German occupation of Northern Italy is given herein. Subsequently they designed and built an experimental model which is described in detail in this report. The experimental equipment launched a projectile weighing approximately 10 Kg., which was in effect a disk 150 mm. in diameter and 120 mm. thick. This weapon might offer a means of shooting small anti-submarine charges to a considerable distance with small deck-blow. One of these men had also done some work on a screw propeller incorporating a form of slot, one object of the slot being to remove the section of the screw where most erosion was experienced. Two diagrams are included.

PB 27161. STAWICK, EDMUND C. and others. Italian 7.5 cm. green cross shell. (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 41) Jul 1945. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27179. STAWICK, EDMUND C. and others. Italian 7.5 cm. red cross shell. (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 39) Jun 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27178. STAWICK, EDMUND C. and others. Italian 10.0 cm. green cross shell. (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 38) Jun 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27180. STAWICK, EDMUND C. and others. Italian 10.0 cm. red cross shell. (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 40) Jul 1945. 4 p. Price: Microfilm-$1.00 - Photostat-$1.00

PB 27177. STAWICK, EDMUND C. and others. Italian 15 cm. white cross shell. (CWS 46th Chemical Lab Co Captured Materiel Tech Rept 37) Jun 1945. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00

Japanese

PB 27183. AMERINE, MAYNARD A. and others. Japanese 50 mm. flare. (CWS 45th Chemical Lab Co Captured Materiel Tech Rept 16) Aug 1944. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
A description of the physical, chemical and functional characteristics of this Japanese flare is given herein. By translation of the Japanese characters on the label it was identified as a green, hanging star, parachute flare. The flare mixture was barium chlorate mixed with shellac and gave a bright green flare. There were five different black powder charges; a black layer next to the flare, the propellant, powder charge, fuse cap, and fuse. The propellant and powder charge were identical in composition. The propellant, powder charge and fuse cap were granular in texture. Drawings are included.

PB 27463. DANSER, JAMES F. Japanese detector kit. (Army Forces in the India-Burma Theater KEIS Chemical Warfare Sect Prelim Tech Rept 10) May 1945. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
No abstract.

PB 27482. FAIRCHILD, ALFRED C. Japanese 12 kg. incendiary bomb. (CWS Foreign Materiel Tech Rept 109). Jun 1945. 15 p. Price: Microfilm-$1.00 - Photostat-$1.00
A complete description of a Japanese incendiary bomb, including photographs and analyses, is given. The munition weighs 11,823 g. and is 27-3/8 in. in length. It consists of a steel tubular case, a heavy steel nose and a long finned tail assembly. The bomb's function upon impact is the base-ejection of three magnesium containers with a thermite type filling.

PB 27220. JACKSON, ROBERT L. Japanese Very type smoke signal cartridges. (CWS 98th Chemical Service Co Captured Materiel Tech Rept 4) Aug 1945. 9 p. Price: Microfilm-$1.00 - Photostat-$1.00
Two parachute type signal cartridges are described. The cartridge cases are entirely of brass, 4 3/4 inches long by 1 3/8 inches in diameter. One of the cartridges is labeled "Black Dragon" and the other "Yellow Dragon". They produce black and yellow smoke respectively. A complete round weighs approximately 6½ ounces.

PB 27213. MILLARD, JOHN E. Japanese hand carried smoke candle. (CWS 98th Chemical Service Co Captured Materiel Tech Rept 12) Aug 1945. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
The candle described is charged with an HC smoke mixture which is ignited by a pull type fuze, quickmatch, and ignition mixture. The unit is constructed and insulated so that it can be held in the hand while operating. The outer container of galvanized sheet steel, insulated by asbestos wrapping, is 22 in. long with a cross section 1½ in. square. Total weight of the candle is 2 lbs. 15 oz. Drawings and photographs are included.

PB 28341. BEAM, L. M. Two HE shells for the Japanese naval type 10 4.7 inch (120 mm) DP gun. (CWS 43rd Chemical Lab Co. Captured Materiel Tech Rept 93) Jun 1945. 30 p. Price: Microfilm-$1.00 - Photostat-$2.00

This report contains the description of two types of fixed HE ammunition, less fuzes, used in the Japanese naval type 10 120 mm dual purpose gun, as well as chemical analyses of the propellants and bursting charges of both shell, and physical and chemical tests of one of the cases. This one case is of unusual construction, the upper section being made from two welded sections of low carbon sheet steel, and the head from heavy machined steel. The two sections are rigidly connected by means of a base cup, washer, and lock nut. This shell was complete with a primer, which is also described. The other shell is of conventional construction with a brass case. The propellants differ, the sheet steel case containing a low nitrated nitrocellulose-nitroglycerine type, the brass case a highly nitrated double base nitrocellulose type. The bursting charges of the conventional projectiles also differ, the projectile connected with the steel case containing trinitroanisole cast through the nose, and the projectile connected with the brass case containing a pre-cast block of picric acid loaded through the base, which is equipped with a threaded removable base plate. Drawings and photographs are appended.

PB 27182. REES, THOMAS and others. Japanese antifreeze container and antidim plates. (CWS 45th Chemical Lab Co Captured Material Tech Rept 26) Sep 1944. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
The antifreeze container for gas mask equipment is described. The antidim plates were of laminated plastic, consisting of two thin outer sheets of cellulose and a thicker central sheet of nitrocellulose plasticized with camphor. Photographs.

PB 27184. REES, THOMAS and others. Japanese anti-parked aircraft bombs. (CWS 45th Chemical Lab Co Captured Material Tech Rept 18) Aug 1944. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
Two Japanese anti-parked aircraft bombs which were duds picked up on the Hangyang Air Base after the Japanese night air raids of May 30 and June 13, 1944, are described in detail in this report. This type of bomb is described in Technical Manual E9-1983, "Enemy Bombs and Fuzes." The bombs were identical in construction and material except that one tail fin was made of aluminum with a trace of manganese and iron and the other was of steel. The tactical use of the bombs was to destroy aircraft on the ground. The officers who sent the bombs in for examination stated that there were a great number of duds, indicating a high percentage of failure for this type of bomb. A drawing is included.

PB 27219. REICHARDT, CHARLES H. Japanese 75 mm. sternutatory shell for the 75 mm. model 41 reg't. gun. (CWS 42nd Chemical Lab Co Captured Material Tech Rept 20) Oct 1943. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
The two shell received and described herein were diphenylcyanoarsine, high explosive shell for use in the 75 mm. Model 41 Regimental Gun. This gun is also referred to as the 75 mm. Model 41 Mountain Gun. Although no fuzes were received with the shell, a description of Type 88 Instantaneous Field Mountain Gun Fuze which was believed to be used with this shell is given, also a description of fuzes used with the 70 mm. gun. This shell has a sternutatory filling to high explosive charge ratio of 33.4 percent by weight. It was concluded that the effectiveness of this shell as a combined casualty producing (high explosive) and harassing (sternutatory) munition against troops was problematical. Tables showing physical characteristics and photographs of the shell and of fuzes are included.

United States

PB 26971. ARMITAGE, A. E. H. E. shell, examination of ten (10) 90 mm shell M58 (induction hardened band seat). (Watertown Arsenal Lab Rept 763/80) Nov 1941. 26 p. Price: Microfilm-$1.00 - Photostat-$2.00
The object of the investigation reported herein was to determine the effect of induction hardening of the region of the band seat on the strength of the shell, and to compare the properties conferred by this method of hardening after machining and nosing with those obtained before machining, as reported in PB 26972. Based upon the study of these shells, it appeared that induction hardening of the cavity in the region of the band seat is at least partially effective in strengthening the shell at this location. It was believed that the results of firing should be depended upon to evaluate the merits of the induction hardening method. Tabulated results, diagrams and photographs accompany the text.

PB 26975. ARNOLD, S. V. Metallurgical examination of 20 mm. H. E. I. shell produced by deep drawing. (Watertown Arsenal Lab Rept Rept 763/307) Sep 1942. 24 p. Price: Microfilm-$1.00 - Photostat-$2.00
The investigation, the details of which are presented herein, disclosed no defects which might render the subject shell unfit for use as a service projectile. The low values for elongation are inherent to the deep drawing process and are neither a reflection on the quality of the steel nor the service characteristics of the shell. The latter can be established definitely only by firing tests. It is stated that susceptibility of these shell to cracking or distortion in storage as a result of the stresses developed by cold working could not be determined, but is a factor which must be considered before the deep drawing process can be entirely approved. Tabulated results, photographs, photomicrographs, and drawings are included.

PB 27185. ASHWORTH, JOHN T. Investigation of clogging in the coils of mechanical smoke generator, M1 (Esso smoke generator). (CWS 41st Chemical Lab Co Tech Rept 31, Supp 1) Sep 1944. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
An investigation of the clogging which had occurred revealed a carbonate scale which dissolved in 10% HCl. It was recommended that water softening units be used with these generators to prevent further deposits. Diagram.

PB 25834. BROWN, S. F. and WILLIAMS, C. M. The development of a rifle grenade for the dispersion of toxic smokes. (Edgewood Arsenal Chemical Div Rept 292). Aug 1923. 23 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report is a revision of Edgewood Arsenal Report 166, and describes a rifle grenade which will generate a toxic smoke for thirty to forty-five seconds and will not explode. The standard K.J. grenade container and the firing device of the British #27 rifle grenade, or the miniature firing mechanism #27, are used with slight modifications. The charge consists of 100 g. of one of two mixtures. The components of these two mixtures are given. Complete specifications and full directions for loading and assembling are included in the report, including diagrams.

PB 25829. BROWN, S. F. The development of the C.N. rifle grenade. (Edgewood Arsenal Chemical Div Rept 282) Apr 1923. 35 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report describes the development of a rifle grenade which generates chloroacetophenone (CN) vapor over a period of 30-45 seconds and which was satisfactory after storage for over 15 months. Full directions for loading and assembling the grenade, and specifications and drawings are included in the report.

PB 25837. BROWN, S. F. and LAWRENCE, W.T. The development of the H.C. smoke grenade. (Edgewood Arsenal Chemical Div Rept 297) Aug 1923. 33 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report describes the development of a non-toxic smoke grenade which evolves a cloud of white screening smoke for about one minute. Hexachloroethane (HC) was chosen as the active principle of the grenade after various materials were tested. The grenade will deteriorate due to moisture but the deterioration after one year's storage is not serious. Experimental data and a blueprint of the HC grenade are included.

PB 23691. HURCHARD, J. E. The new vertical firing chamber and concrete laboratory at Princeton University. Progress report. (NDRC Rept A-54; OSRD Rept 595) May 1942. 29 p. Price: Microfilm-50¢ - Photostat-$2.00
This report describes new buildings and equipment which were added to the experimental firing range of the National Defense Research Committee at Princeton University June 1, 1941 to May 25, 1942. A description of each room is supplemented by floor plans and photographs. For a description as of May 31, 1941, see OSRD Rept 10, PB 23677.

PB 28956. CONKLING, L. J. Sealing lachrymatory, C.N. candles, 1-lb., Mark I, for use in the tropics. (Edgewood Arsenal Chemical Div Rept 501) Jan 1929. 23 p. Price: Microfilm-$1.00 - Photostat-$2.00
The report describes tests with chloroacetophene (CN) candles. The candles were sealed by coating the tapes with various lacquers and paints and subjecting them to increased heat and humidity. Control candles were also subjected to the same treatment. The results of the tests are tabulated.

PB 28639. CROFT, H. O. and others. Design of mechanized flame thrower in M4A3 tank retaining 76 mm. gun. Final report. (OSRD Rept 6015) Sep 1945. 79 p. Price: Microfilm-$2.00 - Photostat-$6.00
When V-J day arrived, the group at the State University of Iowa was in the early state of fabricating twenty large flame throwers for field installation at fourth echelon shops. The design was one of six which had previously been worked out in some detail by the Iowa group. This report presents the six preliminary designs and such details of the final design as were ready when the group was asked to stop work. A sketch, flow sheet, layout, and assembly drawing, as well as sectional drawings and photographs, are included.

PB 23689. DAVIS, LEVERETT, Jr., and others. The antisubmarine bomb: Part I. Progress report. (NDRC Rept A-74; OSRD Rept 758) Jul 1942. 56 p. Price: Microfilm-$1.00 - Photostat-$4.00
The recently developed jet-propelled antisubmarine projectile and projector are described comprehensively. Since the writing of the preceding report on this weapon (OSRD Rept 563), a suitable fuze has been developed and tested. Moreover, the shape of the charge has been changed, suitable firing control equipment has been produced, and the design of the projector has been modified, with the result that manufacturing cost has been reduced and the reliability of performance improved. The report contains: Summary of ballistic data for the bomb, photographs, sectional drawings, specifications pressure curves, firing data, performance data, curves, and trajectory data.

PB 23680. DAVIS, LEVERETT, Jr. and ROBINSON, CHARLES F. Controlled striking angle of rocket projectiles. Progress report. (NDRC Rept A-58; OSRD Rept 605) May 1942. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
A jet-propelled device that may be made to strike the ground at any desired angle has many possible uses, but of particular interest is its application as an antisubmarine bomb. A practical and theoretical solution to the problem of developing such a device is given in this report, prepared at the California Institute of Technology. The method of producing the desired angle of impact was that of misalining the nozzle axis slightly, so that the off-axis thrust tended to rotate the projectile. In the experimented work the motor was made entirely separate from the bomb, so that during flight the motor chamber fell free and was not damaged upon impact. The jet-propelled device weighs 80 lb. and can be fired a distance of about 90 ft., with a rotation of about 10° ± 10 percent of the total rotation, and with a dispersion in range of approximately 3 ft. With propellants of satisfactory quality, it should be possible to reduce these dispersions to at least half their present values. This report describes both a practical and theoretical solution to the problem of developing a jet-propelled device that may be made to strike the ground at any desired angle. The report contains photographs, test tables, sketches, and diagrams.

PB 27158. DENUES, A. R. T. Studies of the 4.2-in. chemical mortar. Preliminary investigations and engineering tests to develop increased range for the 4.2-in. chemical mortar by means adapted to immediate field application. (NDRC Armor and Ordnance Rept No. A-178; OSRD Rept 1473) Apr 1943. 121 p. Price: Microfilm-$3.00 - Photostat-$9.00
The use of powder of 0.025-in. web, as detailed in this report, gives satisfactory interior and exterior ballistics and functionings of the standard shell for ranges from about 800 to 4500 yards. Flights of FS, WP and CG shell have been found satisfactory in limiting tests conducted under extreme conditions of elevation and range, and the propellant and shell function satisfactorily at temperatures ranging from -20° to 130° F. Movements of the mortar assembly on soft ground for firings with powder of 0.025-in. web have been found comparable with those for 8 to 12 bundles of the MV propellant. Muzzle flash is substantially reduced even at maximum charge by use of the powder of 0.025-in. web. Distribution of pressure in the barrel with the augmented charges of powder of 0.025-in. web leaves reasonable factors of safety for strength at all sections. A suggested design of the new propellant simplifies the field use of the shell by providing it with the full charge assembled thereon, ready for immediate use after quick removal of any unwanted slit bundles of powder.

PB 27159. DOWKER, C. H. Dispersion of a rotating rocket. (NDRC Armor and Ordnance Rept A-184; OSRD Rept 1460) May 1943. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
A theoretical development is given for the dispersion of a rocket in vacuum because of malalinement of thrust for three cases: Nonrotating rocket; rotating rocket with constant angular acceleration; and rotating rocket with constant angular velocity. The ratio of the dispersion in each of the latter cases to the dispersion for a nonrotating rocket is calculated for various numbers of rotations after the rocket leaves the tube. These calculations show that a considerable decrease in dispersion could be brought about by a reasonable amount of rotation. Gyroscopic effects and forces due to gravity and to air resistance are neglected. Should it be desirable to project rockets from airplanes flying at high altitudes, where near vacuum conditions prevail, the findings of this report would be of much interest.

PB 25526. EHRENFELD, DAY. Report on the adaptation of the chloroacetophenone - white phosphorus mixture to the incendiary drop bomb, Mark I. (Edgewood Arsenal Chemical Div Rept 42). Jun 1921. 2 p. Price: Microfilm-$1.00 - Photostat-$1.00
When white phosphorus and chloroacetophenone were mixed and exploded in the White Phosphorus Grenade, the maximum lachrymatory properties obtainable without destroying the utility of the grenade as a smoke screen producer were not marked enough to make its use practical. When the same mixture was used in the incendiary Drop Bomb, Mark I, a smoke screen having strong lachrymatory properties was produced.

PB 25502. FAIRCHILD, ALFRED C. Modifications to increase the anti-personnel effect of the grenade, hand, smoke, WP, M15. (CWS Tech Div Memo Rept 1239) Apr 1944. 51 p. Price: Microfilm-$2.00 - Photostat-$4.00
It was determined that the casualty effect of white phosphorus (WP) was definitely increased by plasticizing or by addition of pellets of steel wool. In the case of steel wool impregnated with WP (S-WP) the size and amount of steel wool pellets were found to be critical. The screening times of the grenades with the modified WP fillings improved 50% to 200% over those with WP. It was recommended that medical research data comparing the casualty effectiveness of the modified WP filling with that of WP be obtained. Tables of test data, graphs, photographs of the bursting effects and diagrams of the smoke grenades are included.

PB 21140 and 21139. FEDERAL CARTRIDGE CORP., ANOKA, MINN. Ignition cartridge -4.2" chemical mortar. Progress reports 1-18, covering the period Dec. 13, 1943 through Sep. 20, 1945; final report and summary of experimental work. Oct. 1945. PB 21140 - 173 p. Price: Microfilm-$2.00 - Photostat-$12.00 - PB 21139 - 73 p. Price: Microfilm-50¢ - Photostat-$1.00

Eighteen progress reports and a final report describe the development by the Federal Cartridge Corporation of an ignition cartridge for the 4.2 chemical mortar. The cartridge was to meet the following requirements. (1) 100% functioning; (2) ability to withstand 43 hours immersion in 3% salt water at least two feet in depth; (3) ability to withstand six months' storage at 85% relative humidity and a temperature of 115° F.; (4) ability to withstand indefinitely storage at 55° F; and (5) ability to function normally at -40° F. Indications are that all of these requirements except (3) have been met or exceeded. Tests of various priming mixtures, shown in detail in Progress Report 1, indicate that K75 mixture with 1.0 grain charges gave the best results. Dupont's J-1300-L-6225 lacquer was deemed the most satisfactory for waterproofing and heat-resistance. Test data reveal that the M2 cartridge fulfilled the immersion requirements for a cartridge. The substitution of Dupont cement formula J-72-0144 for cellulose acetate lacquer as a waterproofing agent for the flash hole of the primer prevented misfires due to moisture. Failure of the cartridges to withstand for six months an 85% humidity at 115° F. did not seem too serious since additional protection was given by sealing in a Reynolds foil-lined bag and M1917 metal box. Tests show that the primer will stand 150° F. storage indefinitely and the cartridge will withstand this temperature for at least a year. An average weight of charge of 1.0 grains of the K75 mixture in the primer eliminated the hangfires and failures to ignite at temperatures of -40° F. and lower. The reason for the increase in pressure due to freezing the cartridges was not clear, but it was found possible to decrease this change in pressure. The final report (PB 21139) contains a summary of the progress reports, specifications, drawings, and procedure for the manufacture of M3, 4.2" mortar ignition cartridges. The formula for the priming mixture has been deleted from these reports.

PB 23675. FOWLER, W. A. The design, development and testing of rocket targets. Progress report, Feb. 1, 1942. (NDRC Rept A-34; OSRD Rept 415) Feb 1942. 48 p. Price: Microfilm-50¢ - Photostat-$4.00
For the purpose of antiaircraft training, the suggestion has been made that a rocket would constitute a satisfactory target provided its position could be made visible either by attaching fins to enlarge its size or by employing a secondary charge that would emit smoke or flame while the moving rocket is in the range of fire. The present report describes recent work done at California Institute of Technology on the design, development, and testing of an improved rocket target. The following subjects are discussed: (1) Requirements for rocket targets; (2) design of a rocket target utilizing multiple column charges; (3) testing of rocket targets; (4) internal ballistics of rocket target motors; (5) external ballistics of rocket targets; (6) projectors for rocket targets; and (7) conclusions. Assembly drawings, sectional drawings, photographs, graphs, tables, and appendices A and B reporting target tests results are included.

PB 23688. FOWLER, W. A. Preliminary tests of the vertical bombing of submarines from airplanes. Preliminary report. (NDRC Rept A-76; OSRD Rept 768) Aug 1942. 38 p. Price: Microfilm-50¢ - Photostat-$3.00
Vertical bombing, accomplished by projecting the bomb backward from an airplane with a speed equal to the forward speed of the plane, has obvious advantages for certain types of operation. One of these is in connection with the recently developed magnetic detector of submarines, which functions when the airplane is directly above the target. Possible disadvantages are dispersion of hits and dangerous flame ejection which might result from rocket propulsion of the bomb. Ground and flight tests were conducted to determine whether the advantages of this type of bombing outweighed its disadvantages. It was found that backward rocket projection of a bomb from an airplane can be safely and successfully carried out and that excellent accuracy can be attained. The description of these tests and the equipment used is accompanied by photographs and drawings. Field tests of vertical flare bombs which were also successful are described.

PB 27147. FULCHER, GORDON S. The temperature of the bore surface of guns. (NDRC Armor and Ordnance Rept A-201; OSRD Rept 1666) Jul 1943. 117 p. Price: Microfilm-$3.00 - Photostat-$8.00
This report consists of ten papers presented at a symposium held at an interim meeting of an informal group representing the Army Ordnance Department, the Navy Bureau of Ordnance and the National Defense Research Committee held in Washington, D. C., on November 19, 1942. The title of the papers are as follows: (1) Surface temperatures inside a 14-in. naval gun during firing; (2) heating of gun barrels by the powder-gas mixture; (3) heat transfer from propellent gases and its effects in erosion vents and guns; (4) heating of rotating bands; (5) determination of the friction between the gun and projectile; (6) temperature of propellent gases; (7) recording temperature-time curves of short duration; (8) measurement of heat transfer at the origin of rifling; (9) temperature rise of a caliber .30 M1 rifle barrel due to firing; and (10) measurements of gun temperatures. Discussion of the papers, also tables, drawings and plotted curves are included.

PB 22968. GREAVES, W. C. A study of possible concussion injury from bullet impact on protective airplane armor. (Bur of Medicine and Surgery Res Project X-90) Nov 1942. 2 p. Price: Microfilm - 50¢ - Photostat - $1.00
This report gives results of experiments designed to ascertain the amount and type of injury to small animals which might result from bullet impact, transmitted through airplane armor plate. The following results of the tests are given in conclusion: (1) Bullet impact caused the armor to bulge approximately 1/8" on the side in contact with the animals; (2) none of the animals exhibited any gross injuries; (3) tests indicate that airplane pilots may not be injured by bullet impact transmitted through steel armor, even though they may be in immediate contact with the protective plates. These experiments were carried out at the Naval Research Laboratory.

PB 25522. GREENBANK, G. R. and KUHN, H. A. Protective clothing. Preliminary report. (Edgewood Arsenal Chemical Div Rept 34) Feb 1921. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
The report describes tests with a protective mixture against toxicants, which is applied to a fabric. In these tests, a double layer of fabric was used between which is a layer of protective material. This produces a cloth which (1) prevented the mixture from soiling or becoming soiled by other garments that were worn, (2) was more pliable after exposure to weather than previously tested material, (3) withstood rain well, and (4) was sufficiently porous for comfort. The formula for the protective mixture and the test data are included in the report.

PB 25528. GREENBANK, G. R. and ROCKWELL, P. O. Preparation of carbon monoxide gas masks for Army - Navy tests. (Edgewood Arsenal Chemical Div Rept 52). Jun 1921. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report gives a description of the method of preparing absorbents and of the assembly and efficiency of the completed gas masks. As can be seen by inspection of the time-efficiency curve, the canister life was 30 minutes to 99% efficiency, 122 minutes to 95%, 133 minutes to 90% and 147 minutes to 80% efficiency. An examination of the absorbents after the run showed that the calcium chloride was badly caked. The breakdown of the hopcalite was undoubtedly due to the poisoning by water vapor after the calcium chloride had been exhausted.

PB 20592. GROESBECK, WILLIAM M. and KUHN, HARRY A. Corrosion of equipment by chemical warfare gases. (Edgewood Arsenal Chemical Div Rept 88). Jan 1922. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
The gases used were chlorine, phosgene, sulfur trioxide, nitrogen peroxide, and bromobenzyl cyanide. The ordnance equipment included rifles and pistols, automatic equipment, Parkerized equipment and a machine gun. Exposures to chlo-

rine gave the only noticeable corrosion; the tests showed the necessity of cleaning all weapons after being subjected to a corrosive gas and of firing immediately all machine gun ammunition which has been exposed. Parkerized equipment is affected less than standard service equipment. This document may not reproduce well. For the subsequent report 125 by T. B. Hine, see PB 20753.

PB 27610. HAM, GEORGE C. Final report of duty in the SWPA and POA (30 July 1944 to 13 November 1944) (CWS Medical Div Rept 17) Dec 1944. 33 p. Price: Microfilm-$1.00 - Photostat-$3.00
The purpose of this mission to the Pacific was to study all aspects of the flame thrower in the field, to determine the cause of death in flame attack, and to gain an accurate knowledge of the mechanism of death in order to indicate the direction developmental work should take to produce more effective fuel and flame throwers. The report covers the following subjects: Flame death; flame attack; armored (mechanized) flame throwers; Japanese flame throwers; Japanese anti-flame protection; smoke grenades; other chemical warfare equipment; and toxic agents. Two appendices on cause of flame death and on use of gelgas firebombs are attached.

PB 23696. HARVARD UNIVERSITY. APPLIED MATHEMATICS GROUP. An exposition of Wiener's theory of prediction. (OSRD Rept 5328; NDRC Applied Math panel Note 20) Jun 1945. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
This account of Prof. Norbert Wiener's general mathematical theory of prediction is presented so that its range of practical usefulness can be more readily assessed by engineers in the possible application of the theory to fire control problems. Prof. Norman Levinson in writing this paper has made a number of significant departures from Wiener's original treatment and introduced several simplifications which greatly contribute to the clarification of the essential mathematical pattern of the theory.

PB 27413. HARVEY, E. NEWTON and MCMILLEN, J. HOWARD. High speed moving pictures of spheres shot into water. (NDRC Applied Math Panel Rept 42.3R) Aug 1945. 55 p. Price: Microfilm-$2.00 - Photostat-$4.00
Prints are reproduced of over 500 frames taken from 29 different moving pictures showing small spheres being shot into liquids. The spheres have diameters from 1/16-inch to 1/4-inch and velocities as high as 3,000 ft/sec. The photographs were taken at the rate of from 2,000 to 7,000 frames per second. The first group of reproductions shows the "explosive" cavity and the splash in water. The second group shows a sphere being shot out of water and a sphere being dropped into water. The third group contains pictures of the cavity and splash in a gel and in a viscous syrup. In the fourth group the cavity in water is shown when developing near a rigid wall and when confined by various obstacles. In the fifth group small rubber balloons near the cavity in water are photographed as they change in shape and volume in accord with changes in the pressure and motion in the water.

PB 24889. HILL, G. ALBERT and CLARKE, R.G. Colored flares, Progress report. (For supplement see PB 24888). (OSRD Rept 4408) Nov 1944. 60 p. Price: Microfilm-$1.00 - Photostat-$4.00
Work was done at Wesleyan University to develop a series of colored flares to rather restrictive specifications of visibility and burning speed. The requirements were that the flare should burn at 15-20 sec./in., and that it should be visible for a distance of 30,000 feet in daylight when a cake 5 in. in diameter was used. The range of colors was to be as wide as possible. Green, white, yellow, and red flares were developed which were visible and distinguishable at 40,000 feet distance, 300 feet altitude, and in full sunlight when burned in four inch cakes. The appendices contain descriptions of Pullmatch designs and diagrams and graphs illustrating the descriptions.

PB 24890. HILL, G. ALBERT and CLARKE, R. G. Underwater flares. Progress report. (OSRD Report 1522) Jun 1943. 26 p. Price: Microfilm-50¢ - Photostat-$2.00
Forty three basic compositions have been developed and tested for use for burning flares in air and in water. The following mixture was prepared for use: Magnesium "200 mesh" 37%; sodium nitrate (CP 200 mesh dried) 55%; "boiled" linseed oil 8%. The first fire mixture was spiked with 2% meal powder to ensure match ignition, and the second fire primer was the mixture as cited, to produce a hotter fire to ignite the flare cake. The apparatus used for testing, the flare mixtures, and the flare casings are described, and tables presenting test data are included in this report of work done at Wesleyan University. PB 24891 supplements this report.

PB 27148. HIRSCHFELDER, J. O. and others. Interior ballistics of recoilless guns. (NDRC Armor and Ordnance Rept A-215; OSRD Rept 1801) Sep 1943. 33 p. Price: Microfilm-$1.00 - Photostat-$3.00
A system of interior ballistics is developed and presented in this report for guns in which the recoil is eliminated by the rocket action of powder gas flowing through a Venturi in the breech. The system is illustrated and applied to numerous examples including the German 7.5 cm. Leichtes Geschutz. The equations for gas flow through the nozzle, the rate of burning of the powder, the rate of increase of powder gas in the gun, the equation of motion and other ballistic equations are given, together with procedures for the calculation of pressure-travel and velocity-travel curves. Included also are a description of a recoilless gun and its operation, and a discussion of the characteristics of recoilless guns. Table II shows calculations for characteristics of hypothetical 105-mm recoilless guns.

PB 22274. HUSS, HARRY O. Chemical defense against attacking airplanes. (CWS Tech Div Memo Rept 306) Apr 1941. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
This report describes the tests to determine feasibility of defending an airplane from attack by the use of chemical agents discharged into the "blind spot" of the airplane. In tests in which panel data were obtained dye water was used. Malachite green and fuchsine dyes were used to give a color contrast on the panels. The two tear gas tests were conducted using a 10% and a 5% CNB (chloroacetophenone in carbon tetrachloride and benzene) solution, respectively. From these tests it was concluded that aerial chemical defense of airplanes was feasible and that further more thorough studies should be made of this question. The document is illustrated with photographs of panels colored in the dye tests and accompanied by an Air Corps Materiel Division account of the experiments.

PB 27149. INGERSON, EARL. A method for testing resistance of metals to surface cracking under conditions similar to those obtaining in guns. (NDRC Armor and Ordnance Rept A-271; OSRD Rept 3628) Nov 1943. 49 p. Price: Microfilm-$1.00 - Photostat-$4.00
In order to determine the resistance of metals to surface cracking under conditions similar to those obtaining in guns, it was necessary to have: (1) an experimental set-up in which the surface to be studied could be subjected to conditions similar to those in a gun with respect to temperature, pressure, composition of the gases and length of time the surface is exposed to the gases; and (2) a specimen which could be examined readily after any number of shots, and then fired again if necessary. The first conditions were met by using an explosion vessel designed by H. S. Roberts of the Geophysical Laboratory of the Carnegie Institute of Washington, and the second by using for specimens short rods with flat areas which could be readily examined and photographed under a metallographic microscope. The experiments are described and the results of tests are discussed and presented in tabular form. Numerous photomicrographs are also included.

PB 26974. JELM, C. R. Pull tests on wide-spaced type of fin on 60 mm. fin assemblies. (Watertown Arsenal Lab Memo Rept 763/585) Feb 1944. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00

Pull tests on the wide-spaced type of fin on 60 mm. fin assemblies for mortar shell showed that these fins failed at loads from 1640 to 1865 pounds. Narrow-spaced fins usually have maximum load values of from 2300 to 2800 pounds. The reduction in the pull test values for the wide-spaced fins is due to the increased tearing action when tested, owing to the wider base of the fin. The "pull test" is a test of weld quality and is interpreted by the type and size of weld nugget remaining on the container as well as by the load value obtained. The quality of the welds was good despite the relatively low load values obtained.

PB 25519. KIRKPATRICK, THEODORE H. Report on specification for Mark III smoke candle. (Edgewood Arsenal Chemical Div Rept 30) Nov 1920. 8 p. Price: Microfilm-$1.00 - Photostat-$1.00
The Mark III smoke candles are designed for use in trench and field warfare, where a small compact article is essential. They are made by packing four pounds of Mark III mixture in a container and are lighted by means of the matchhead type of ignition. Smoke is given off at a uniform rate for four minutes forming a dense fog-like cloud which hangs low. This smoke is absolutely harmless and can be breathed without discomfort. The obscuring power is rated high. The report describes the preparation of the chemical mixtures, changing the smoke candle, method of operation and inspection.

PB 23682. KING, R. B. and others. The chemical warfare grenade. Progress report. (NDRC Rept A-57; OSRD Rept 585). May 1942. 26 p. Price: Microfilm-50¢ - Photostat-$2.00
A chemical warfare grenade has been developed to meet specifications formulated by the Chemical Warfare Service. It is designed for use with a projector that can be carried and operated by one man. Over 300 rounds of experimental models have been fired, resulting in modifications in design which are summarized in this report. Also included in the report are the specifications and construction of the "standard" model, and data on the ballistics and performance of both the "standard" and experimental models. Photographs, graphs and diagrams illustrate the text. This is a progress report under contract with the California Institute of Technology.

PB 25529. KLOSKY, SIMON and STRICKER, PAUL F. The physico chemical constants of chloroacetophenone. Report 8. (Edgewood Arsenal Chemical Div Rept 59) Aug 1921. 21 p. Price: Microfilm-$1.00 - Photostat-$2.00
It is concluded that since there is a likely amount of data on the vapor pressure and density, the one most pressing constant to be determined is the heat of combustion, as upon this so many other constants may be calculated.

PB 26978. LEMENT, B. S. Bayonet blades, investigation of WD-1080 steel for use in bayonet blades. (Watertown Arsenal Lab Rept Rept 320/29) Jan 1944. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
As a result of hardness, impact, and bend tests and microexamination described in this report, it was concluded that the metallurgical characteristics necessary to produce optimum hardness and ductility in WD-1080 steel for bayonet use result from a substantially homogeneous microstructure consisting of tempered martensite of Rockwell "C" hardness 46-52. Increased impact strength at a Rockwell "C" hardness of 56-57 may be obtained with an inhomogeneous microstructure resulting from a low hardening temperature. However, this increase is not considered sufficient to offset the practical disadvantages involved in applying such a heat treatment for the hardening of WD-1080 steel bayonet blades in regular production. Included are tabulated results, photomicrographs, and a curve showing impact strength vs. draw temperature and hardness.

PB 23711. LEWIS, D. C. Extrapolation by least squares with application to AA fire control. (NDRC Applied Math Panel Memo 99.1M; Columbia Univ Applied Math Group Rept 226) Feb 1945. 18 p. Price: Microfilm-50¢ - Photostat-$2.00
The prediction problem in antiaircraft fire requires that a coordinate for the position of the target at the time of impact be predicted from information about the coordinate taken in a period of time preceding the instant of firing the projectile. Even if tracking gives the coordinate with small errors, the rate of change of the coordinate computed from the information may have a large error. For this reason it is generally customary to resort to so-called "smoothed rates". A variation of this procedure has been suggested by the Bell Telephone Laboratories. Namely, since the prediction of a coordinate is essentially an extrapolation, it has been proposed to use least square approximation to obtain an extrapolating polynomial. In this memorandum an integral expression for the error incurred in such a procedure is obtained. It may be further remarked that prediction by the memory point system may also be regarded as a least square approximation in which the integral to be minimized is replaced by a finite sum. Appendix B is a proof of the main theorem.

PB 19845. LIBSCH, JOSEPH F. Case hardened magazine tubes caliber .30 M1 carbine. (Springfield Armory Eng Dept Tech Rept WO 800) Mar 1945. 11 p. Price: Microfilm-50¢ - Photostat-$1.00
Case hardened magazine tubes showed a marked increase in the service life of the magazine. Some tubes have been fired for 6436 rounds or 429 loadings without deformation or damage to the retaining nibs. Standard magazines average 260-300 rounds. Magazine tubes were strain relieved at 950° F. carburized in liquid salt at 1600° F. to produce a case depth of .005", oil quenched, and tempered at 400° F. to an equivalent hardness of Rockwell "C" 59 at the surface. Tables and photographs illustrate the test report.

PB 19846. LIBSCH, JOSEPH F. and GUESS, ROBERT D. Induction heating - selective hardening. Part I: Piston of "C & R" operating assemblies, M1 rifle. (Springfield Armory Eng Dept Tech Rept WO 783-1st Partial) Nov 1944. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
As a result of investigations reported herein it was recommended that "C & R" operating rod assemblies for the M1 rifle refitted with new pistons be induction heated at the piston end for hardening the piston and treating the weld and heat affected part of the tube in production. Since operating rod assemblies currently being manufactured did not achieve maximum available hardness on the piston, it was recommended that consideration be given application of induction heating for selectively hardening the piston on current production rods. A description of the operation of the Lepel high frequency converter on which the work was done is included. Photographs showing equipment and procedure accompany the text.

PB 19838. LUUKKONEN, V. A. Report of tests of caliber .50 M2 heavy barrel Browning machine gun flash hiders C7162073 and C7162096. (Springfield Armory Eng Dept Tech Rept WO 882) Jun 1945. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
Firing tests made to determine the strength, functioning and effectiveness in reducing flash, showed that both flash hiders decreased flash considerably, with flash hider C7162096 being more effective than C7162073, due to greater length of cone. Flash hider C7162073 had a tendency to loosen on the barrel during firing, apparently due to upsetting of nut at point of contact with shoulder on the barrel. On flash hider C7162096, the bolt must be drawn up very tightly to lock the flash hider on the barrel. Both flash hiders add considerable weight to the barrel. Details of the investigation are given. Photographs mentioned in this report are not included.

PB 22278. MACINTIRE, BENJAMIN G. and LOEW, THEODORE. Test of smoke shell, base ejection type, 105-mm howitzer reconditioned. (CWS Tech Div Memo Rept 312) Aug 1941. 24 p. Price: Microfilm-50¢ - Photostat-$2.00

This is a report on the development of a smoke filling for the 105 mm. howitzer shell similar in performance to that of the British 25 pounder. No previous work had been done at Edgewood Arsenal in the use of a burning type smoke mixture in a base ejection shell. However, work conducted in the development of a 5 inch base ejection shell employing a bursting type canister filler covered by E.A.T.R. 338 is applicable in this particular case. The British mixture and the HC standard mixture functioned satisfactorily and appeared to produce about equal volumes of smoke. The burning time of the HC mixture appeared to be slightly longer but this may be accounted for as due to the slower starting of the HC mixture. The smoke produced by these mixtures compared favorably with that produced by the British 25 pounder.

PB 27161. MALLINA, R. F. and DIETZ, J. M. Light-weight rocket projectors. (NDRC Armor and Ordnance Memo A-89M; OSRD Rept 3446) Apr 1944. 24 p. Price: Microfilm-$1.00 - Photostat-$2.00
In the development of a light-weight ground launcher for the 4½-inch rocket several models have been built and tested, improvements being incorporated in the latest design, projector no. 7. Projectors no. 5 through 7 are described in the present report. All models are provided with both coarse and fine adjustment of azimuth and elevation. The projector fits into a convenient carrying case from which it can be unpacked and assembled for use in about one minute. Special cases are also described for use when three of the projectors are to be dropped together for paratroops. Drawings and photographs are included.

PB 27160. MALLINA, R. F. and HIGGINS, P. T. Firing mechanism for the 7-in. chemical rocket projector. (NDRC Armor and Ordnance Rept A-187; OSRD Rept 1484) May 1943. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00
A method of ripple firing rockets in measured time intervals has been developed that involves standard switching equipment such as is employed in telephone central offices, the timing being done by slow-release relays. Three units have been completed for installation on 7-inch chemical rocket projectors. Photographs and a wiring diagram are included in the report, which was prepared in cooperation with the Bell Telephone Laboratories.

PB 27163. OSBORNE, D. W. and WALKER, M. J. Tests of rotating Budd 4½-in. rockets. (NDRC Armor and Ordnance Rept A-205: OSRD Rept 1703) Aug 1943. 28 p. Price: Microfilm-$1.00 - Photostat-$2.00
Rotation during the burning period outside the projector has been suggested as a means of reducing dispersion of rockets. Tests at the Jet Propulsion Research Laboratory, Indian Head, Md., are described in which Budd 4½-inch rockets have been caused to rotate at approximately 1000 rev/min by means of inclined vanes in the venturi exit cone, and comparison made of the dispersions of rotated and unrotated Budd rockets. If the burning distance is long, the dispersion is considerably reduced by rotation. For short burning distances the dispersions of both rotated and unrotated rockets are fairly good, that of the rotating rounds being slightly better. Graphs, photographs, drawings and tables accompany the report.

PB 25527. PENNING, CHESTER H. Description of the smoke filter impregnation apparatus (stationary type). (Edgewood Arsenal Chemical Div Rept 45) Jun 1921. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
It was felt that the efficiency of smoke filters would be improved by filling the larger pores of the filters with finely powered materials. A description of the apparatus for this purpose is given. Tests on felt filters which were impregnated with lamp black indicated that the material cannot easily be shaken off the filter. A number of canisters so impregnated were severely shaken and knocked about for thirty minutes, and indicated no decrease in protection over similar canisters not so severely handled.

PB 27143. PUGH, EMERSON M. Explosion chamber muffler. (NDRC Armor and Ordnance Memo A-84M; OSRD Rept 3237) Feb 1944. 10 p. Price: Microfilm-$1.00 - Photostat-$1.00
Diagrams illustrate the description of an explosion chamber muffler which was built to prevent damage to structures in the neighborhood and to reduce the noise nuisance caused by explosions. A description of the explosion chamber and the experimental work of this project is presented in OSRD Rept 3199, NDRC Confidential Rept A-242, dated Jan 1944.

PB 27152. REYNOLDS, GEORGE T. Charge orientation tests. (NDRC Armor and Ordnance Rept A-193; OSRD Rept 1532) Jun 1943. 24 p. Price: Microfilm-$1.00 - Photostat-$2.00
Pressure-time records in connection with small charge air blast phenomena were measured along a line coinciding with the axis of a small cylindrical bare charge weighing ½ lb. These are compared with the decidedly different records obtained in a plane perpendicular to the axis through the center of the charge. These measurements were suggested by earlier experiments which indicate definite directional effects in pressure around a cylindrical charge. The present results confirm the earlier experiments and yield information as to the behavior as regards peak pressure of bombs of similar shape. All of the available data are reported, and two possible explanations for the difference are offered, of which an explanation on the basis of an interaction between the shock waves coming from the end and in the side surfaces of the charge seems to be the more complete. Prints of records, diagrams, and tables are included. The study was made at Princeton University.

PB 27150. REYNOLDS, GEORGE T. Small charge air blast experiments. (NDRC Armor and Ordnance Rept A-191; OSRD Rept 1518) Jun 1943. 23 p. Price: Microfilm-$1.00 - Photostat-$2.00
Experiments carried out at Princeton University are reported that yield a relation between excess peak pressure and equivalent distance for bare charges weighing ¼, ½, 1, and 2 pounds. Investigations of the details of the shock wave produced by such charges are described. The method of recording utilizes piezoelectric gages with suitable amplifiers and linear sweep apparatus. Graphs present results of these experiments conducted at the Princeton University Station.

PB 25507. ROCKWELL, P. O. and KUHN, H. A. Report on Connel canister tests. (Edgewood Arsenal Chemical Div Rept 8) May 1920. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
Tests were conducted with seventy Connel canisters, manufactured by Reeds, Ltd., Liverpool, after the canisters had been in storage about two years. The charcoal and soda lime mixture was found badly caked and some metal parts of the canister showed extensive corrosion. When tested with chloropicrin, it was found that the average life was only one minute, the maximum three minutes. Attempts at renovating the canisters were not effective and it was recommended that the canisters be scrapped and salvaged.

PB 27162. ROSSER, J. BARKLEY. Relations between a rocket and its equivalent shell. (NDRC Armor and Ordnance Rept A-231; OSRD Rept 2085) Nov 1943. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
The equivalent shell of a rocket is a shell whose trajectory would coincide with the trajectory that the rocket has after burning ceases. In the present report formulas are given for computing data needed for the equivalent shell in order to enable one to determine range, time of flight, and so forth, from the existing ballistic tables for shells. The work was done at the Jet Propulsion Research Laboratory, Indian Head, Maryland, under a contract with George Washington University.

PB 23683. SAGE, B. H. and LACEY, W. N. Preliminary report on the use of ballistite turnings in primers. Progress report. (NDRC Rept A-56; OSRD Rept 577) May 1942. 16 p. Price: Microfilm-50¢ - Photostat-$2.00

Combination of magnesium flash powder, oxidant and a suitable grade of black powder have usually been employed as primer charges for the ignition of extruded double-base propellants. In experimental static-firing operations relating to jet propulsions, however, it is desirable to employ some types of primer charge that does not produce deposits of solid material upon the face of the nozzle, such as usually result from inorganic constituents in igniters. For this reason attempts have been made to utilize ballistite turnings, prepared from extruded solventless stock, as the primer charge. The experimental work at California Institute of Technology reported here is preliminary in nature and was not directed toward the ignition of propellants in service use. Sketches, graphs, and tables are included.

PB 22708. SARD, ARTHUR. The combination of a random and a systematic error. (NDRC Applied Math Panel Memo 104.4R Columbia Univ Applied Math Group Rept 299) Sep 1945. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
This report gives graphs of the probability of hitting a circular disc when the bullet pattern is circularly symmetric and gaussian. The graphs and their import are discussed in Sections 1-4, taking up the effect of dispersion, and of systematic error and the scope and limitations of the graphs. The remaining sections give the mathematical formulas for the probability given in the graphs, the derivation of the approximate formula and a formula for the probability of destroying the target.

PB 26976. SCHWITTER, C. M. H. E. shell, metallurgical examination of 3" H. E. shell, M42A1, induction hardened by the Budd Wheel Company, Detroit, Mich. (Watertown Arsenal Lab Rept 763/130) Jul 1942. 24 p. Price: Microfilm-$1.00 - Photostat-$2.00
The object of the investigation reported herein was to make a metallurgical examination of the subject shell to determine if induction hardening strengthens the shell sufficiently to eliminate the necessity for standard heat treatment. The shell investigated were as forged from WDSS-3 steel containing .58% carbon and .33% manganese and were induction hardened at the inner shell wall to a depth of 0.16-0.19 inch in a zone extending from band seat to bourrelet. Specimens from two shell developed, after etching for macro- and microexamination, cracks at the zone of maximum hardness in the region of the band seat. This conditions, indicative of severe internal stress as a result of heat treatment, seriously impairs the strength of the shell in an area where strength is of importance. Efforts to measure the strengthening effect of the induction hardening treatment were unsuccessful and simple ring compression tests were unsatisfactory because of stress concentration effect. Further discussion of the results of tests is given. It was concluded that the inability of the induction hardening process to strengthen the base of the shell, and the presence of internal stresses capable of producing cracks at the band seat in the shell investigated, were serious defects which should be corrected before locally induction hardened shell could be considered suitable for service projectiles.

PB 26977. SCHWITTER, C. M. High explosive shell (cast steel), experimental 3" AA(M42) steel shell vacuum cast in chill molds. (Watertown Arsenal Lab Rept 763/117) Apr 1942. 24 p. Price: Microfilm-$1.00 - Photostat-$2.00
Metallurgical examination of three of the above mentioned shells is reported herein. Tests on the quenched and tempered shell made from WD 1040 steel of slightly raised silicon content, revealed the material to have inferior ductility, well below the permissible limits for elongation and reduction of area of forged shell. This low ductility can be attributed to the unfavorable distribution of inclusions in the grain boundaries and to persistent ferrite segregation not removed by the simple oil quench and tempering treatment to which these shell had been subjected. Yield and tensile strength requirements were amply exceeded and Brinell hardness through the shell was uniform. Considerable center-line porosity in the shell walls was detected. Fragmentation of these shell, obtained by Picatinny Arsenal, produced results characteristic of cast shell, with a large number of favorably shaped fragments. Photographs, photomicrographs, tabulated results, and drawings are included.

PB 22971. SHELESNYAK, M. C. and MARGOLIS, S. I. Design and evaluation of an armored standard Navy life jacket. (Bur of Medicine and Surgery Res Project X-227, Rept 3) Jan 1945. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This report describes a method of incorporating flexible non-metallic armor into the standard Navy life jacket. The material used is a glass cloth-bonded laminate (Doron). The armored jacket provides protection from missiles and high explosive shell fragments as well as adequate buoyancy. The incorporation of the armor requires no changes in style or in method of manufacture of the jacket other than the insertion of single sheets of the flexible Doron in each half of the front and back. The area of protection is 5.6 square feet and the overall weight of the armored jacket is 11.3 pounds, an increase of 5.55 pounds. Results of the tests for resistance to penetration of 20 mm high explosive fragments are tabulated at the National Naval Medical Center, Bethesda, Md. Photographs illustrate the report.

PB 22970. SHELESNYAK, M.C. and others. Effectiveness and practicability of body armor in preventing injuries from bullets and other missiles. (Bur of Medicine and Surgery Res Project X-227, Rept 2) Jul 1944. 18 p. Price: Microfilm-50¢ - Photostat-$2.00
A study was made at the National Naval Medical Center, Bethesda, Md., to determine the effectiveness, establish the physiologic criteria, and evaluate the need of various types of body protection and armor with special reference to the requirements of the Navy and Marine Corps. A physiologic-ballistic laboratory was constructed and equipped with range, fire-arms, ammunition, loading tools and accessories. A spark recorder type chronograph for measuring missile velocity was built. A series of dog experiments, testing the efficacy of fiber glass-plastic laminate armor (Doron) was carried out and results tabulated. Experimentally designed armor, including a vest armor jacket and an overall type armor suit, are described. The vest was subjected to firing tests. Diagrams and photographs illustrate the report.

PB 23677. SMYTH, H. D. Construction of the NDRC experimental firing range at Princeton University. Progress report. (NDRC Rept A-6; OSRD Rept 10) Jun 1941. 29p. Price: Microfilm-50¢ - Photostat-$2.00
Plans and photographs illustrate this description of the firing range for the experimental investigation of penetration phenomena at Princeton University. The activities relative to the construction of the range are set forth with an itemized account of the expenditures. For information on buildings added after May 31, 1941, see OSRD Rept 595, PB 23691.

PB 23676. SMYTHE, W. R. A projector for rocket targets. Progress report, Feb 24, 1942. (NDRC Rept A-47; OSRD Rept 501) Mar 1942. 19 p. Price: Microfilm-50¢ - Photostat-$2.00
The ideal projector for rocket targets differs considerably from a projector designed for use in warfare. Because it need not be quickly transported under combat conditions and over all types of terrain, it can be made much lighter; because it need not be trained on a continually moving object, its aiming and firing mechanism can be greatly simplified. The design and construction of this projector is described in detail. The report which was prepared at California Institute of Technology, includes photographs and assembly drawings.

PB 26973. SQUIRE, A. 3" H. E. AA cast steel shell, the relative physical properties of the side walls and bases of 3" cast H. E. shell. (Watertown Arsenal Lab Rept 763/113) Jul 1942. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
Experimental studies showed that, in general, the yield strength of the bases of the subject shell was found to be lower than that of the walls. The tensile strength of the bases was found to be greater than that of the walls, but the reverse was true for the forged shell which was included in the experiment for the purposes of comparison. Ductility as measured by percent elongation and reduction in area was

found in general to be greater in the bases than in the walls for the cast shell, but the reverse was true for the forgings. Hardness was found to be the same for the base and for the walls of the cast shell, as was substantially the case for the forged shell. Tabulated results are included.

PB 25399. STEPHENS, OLIN J., II. Final report on project "Snake". (OSRD Rept 5942, NDRC Rept 12-118) Jun 1945. 3 p. Price: Microfilm-$1.00 - Photostat-$1.00
Report states that a design drawing was submitted by Sparkman and Stephens to the Gulf Research Corporation for a shoe that could be fitted to the forward end of the "Snake", having the general characteristics of a vee bottom high speed motor boat with developable bottom sections, which might well provide the necessary directional stability. Only chronological history of project is given. The report does not define a "Snake".

PB 19854. STURTEVANT, W. B. Deflection test of three belt feed levers, Cal. .50 M3 MMG. (Springfield Armory Eng Dept Memo Rept WO 912) Jul 1945. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
This office memorandum presents in tabular form data from a deflection test of belt feed levers cal. .50 M3, a test for permanent set of cal. .50 M3 belt feed lever, and deflection and permanent set of a standard belt feed lever manufactured by High Standard.

PB 23804. U. S. ORDNANCE DEPARTMENT. History of artillery ordnance research work at Purdue University. May 1946. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
In July 1944 the Mechanical Engineering Division of the Engineering Experiment Station at Purdue University undertook an extensive research program for the U.S. Ordnance Department covering the development of instruments for measuring temperature fluctuations occurring during extremely short intervals of time. During the course of the investigations techniques and apparatus were developed for measuring the temperatures in large hollow caliber gun barrels during firing operations. The techniques devised may be used in the solution of many industrial problems. Research was also conducted on heavy artillery for measuring internal pressure, the progress of the projectile through the gun tube, and the stresses set up in the gun tube during fire. This required development of high speed recording devices which would follow the pressure, strains, and positions of the shell at speeds heretofore considered impossible. As a part of the work three-dimensional photoelasticity studies of models were undertaken. These studies involved the development of materials which would behave in such a way that stresses imposed in the material at elevated temperatures would leave a permanent record of their existence so that when the material had cooled down, it could be examined by passing polarized light through it and a record be obtained of the stresses that were in it at the time the pressure was applied.

PB 23801. U. S. ORDNANCE DEPARTMENT. Mechanism, traversing, dual, for 3" gun motor carriage, M10. Project report, Mar 17, 1943 - Oct 7, 1944. Oct 1944. 17 p. Price: Microfilm-50¢ - Photostat-$2.00
The objective of this project was the development of a manually-operated traverse mechanism, which would permit operation from dual stations and would be more efficient, more durable, and would provide greater comfort for the gunner than the mechanism with which the gun motor carriage, M10 was originally equipped. A spur-gear type traverse gear box equipped with an overload clutch was found more efficient and more durable. However, the project was closed in view of the termination of production of the M10 carriage. Appendix B contains photographs, drawings, and graphs. Appendix C contains an illustration of a dual experimental traverse mechanism for 3 in. gun motor carriage M10.

PB 26972. WALSTED, J. P. Metallurgical examination tores (3) 90 mm. M58 lot, 4654-X4 shell, induction hardened interior in way of band seat. Fixed for recovery at Aberdeen Proving Ground. (Watertown Arsenal Lab Memo Rept 763/72) Jul 1941. 7 p. Price: Microfilm-$1.00 - Photostat-$1.00
The results of an examination of the subject shell are presented in this report. Chemical analysis showed that the shell was of X1340 steel. The induction hardening was effective in that considerable hardness was imparted to the shell wall in the way of the band seat. The tensile properties were erratic. Heat treatment (1600° F.- two hours - air cool) raised the physical properties to a high level and made them more uniform. The effect on the impact values is given, as well as the results of macro and micro examination. Tabulated results, diagrams, a photograph showing hardened zone of a shell, and photomicrographs are included. See also PB 26971.

PB 27385. WEIDLE, Mixed heavy high explosives capable of being cast up to a density of 2.6. (BIOS Halstead Exploiting Centre Rept 5532) n. d. 5 p. Price: Microfilm-$1.00 - Photostat-$1.00
This is a translation of a German report. High explosive mixtures were produced with TNT as the fusible ingredient, zinc to increase the weight and HDX and aluminum to improve the efficiency. Experiments were performed with this mixture to estimate its capacity for being cast and the amount of segregation in the molten flux. As a result of these discoveries it will be possible to produce useful cast high-explosives of these four ingredients up to a density of 2.6. Their performance, measured by the bellying of a lead pig, approximately reaches that of pressed nitropenta (pentaerythritol tetranitrate) with 10% wax, and in special cases is even a little higher. The high-explosives can still be used for a calibre of 2 cm. A table shows the result of tests with varying percentages of the components.

PB 23695. WHITNEY, HASSLER. Tracking and the fire control problem. (OSRD Rept 5680; NDRC Applied Math Panel Note 21; Columbia Univ Applied Math Group Rept 441) Sep 1945. 79 p. Price: Microfilm - $1.00 - Photostat - $6.00
The main object of this report is to give a general description of the problems arising in tracking. Methods of study that might be applied to particular cases are stressed as much as specific results. The purpose of tracking is to obtain gun positions as accurately as possible. The treatment is, of necessity, primarily mathematical. For simplicity equations are used that apply most directly to the case of turrets in a bomber. The general discussion is followed by chapters presenting an analytical study of tracking, and a study of gun errors. The appendix discusses linear differential equations.

PB 19839. ZAVARELLA, A. Accuracy test of cal. .30 M1 rifles with "bell-mouthed" barrels. (Springfield Armory Eng Dept Tech Rept WO 879) Oct 1945. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
Results of tests indicated that the bell mouth condition alone is not the major cause of inaccuracy in barrels so worn. Barrels artifically bell-mouthed did not approach the inaccuracy obtaining with similar barrels with barrel wear produced by actual service. Removal of 5/16" from the end of barrels worn by service did not consistently improve results. It is believed that when a rifle barrel is worn to the point that it is noticeably bell-mouthed, it is unserviceable from a point of general wear. Tables showing results of firing tests are included.

PB 19844. ZAVARELLA, A. Temperature of barrel and gas cylinder body of Browning automatic rifle, Cal. .30 M1918A2 under continuous firing conditions. (Springfield Armory Eng Dept Tech Rept WO 812 -4th Partial) Oct 1945. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
Tests were made to determine the maximum temperature of the barrel and the gas cylinder body at the gas port when the rifle was fired 500 rounds continuously. Temperature reaches a maximum around 400-450 rounds. The maximum for the barrel was 840° F. and for the gas cylinder 760° F.

PHOTOGRAPHIC AND OPTICAL GOODS (INCLUDING PHOTOGRAPHIC PROCESSING)

German

PB 26897. ABRAMS, TALBERT. Report on German photogrammetric equipment, stereoscopic X-ray, automatic camera mount, 9 lens cameras. (JIOA Rep 52). Sep 1945. 109 p. Price: Microfilm-$3.00 - Photostat-$8.00
This report covers visits to the following firms and individuals: C. A. Steinheil Söhn G.m.b.H. Optical Werke, München (automatic camera mount); Photogrammetria G.m.b.H., München (9 lens cameras); E. O. Meester, Sales Manager, Carl Zeiss Co. of Jena (information on Zeiss personnel, photogrammetric equipment and future plans); Deutsche Wiegelmann-Gesellschaft m.b.H., Hoheim-Hüsten, Westphalia (stereoscopic X-ray machine); Ernst Leitz, Wetzlar, Plant No. 1 (small cameras); Hansa Luft-Bild, Subsidiary of Luft-Hansa, Tempelhof Airport, Berlin (condition of photogrammetric equipment and activity); Dr. Rosbaud, Technical Director of Springer Verlag Co., publishers of scientific books and publications, Berlin (data on small buttonhole cameras and aerial survey equipment). The report from Steinheil includes drawings of an experimental gyro controlled automatic camera mount control. Attached to the report from Photogrammetria are photographs of a pocket stereoscope, illustrated pamphlets in English and French and a German reprint by R. Baring on the PK panoramic camera, including a triangulator and other accessory equipment. Attached to the report from Deutsche Wiegelmann -Gesellschaft are photographs, drawings, patents,(in German) a cable to the U.S. Secretary of State, an article by Dr. Werner Teschendorf and a reprint of an article by A. Richard (in German with English translation) relating to Wiegelmann's invention. This permits the surgeon to view stereoscopically under X-ray while operation is in progress by an arrangement of two X-ray tubes above the patient and a mirror below the fluoroscope. The light screen is mounted under the operation table. The surgeon wears a pair of special spectacles with vibrating shutters synchronized with the alternating current powering the X-ray tubes, thus obtaining the stereoscopic effect.

PB 25262. FÜNFER. Report on spark kinematography of attack of armour plates at a proving ground in daylight. (BIOS Halstead Exploiting Centre Rept 525) n. d. 43 p. Price: Microfilm-50¢ - Photostat-$3.00
This report from the Physical and Ballistics Institute of the Air Warfare School, Berlin, describes a spark apparatus that takes three pictures one after the other with three Leica cameras at intervals of a few milliseconds for the photography of armor penetration in daylight. A later report (PB 25025) describes the details and mode of operation of a new circuit developed to make the equipment mobile, and to increase the number of pictures from three to four. The work was carried out with the support of the Research Department of the Technical Office of the Air Ministry. The Kerr cell was used because by choosing a suitable electrical voltage impulse the time during which it is open can be made almost of any desired shortness. The plate separation in the Kerr cell chosen was 2.5 cms., and the length of the Kerr cell along the light path was fixed at 2 cms. Also described are the mechanical shutter, the illuminating spark, the circuit for producing the illuminating spark and for controlling the Kerr cell, the delay apparatus, the method of operation of the Kerr cell in the given circuit, circuit for the triple spark apparatus, stereoscopic pictures, and proposals for further development. Photographs of the German text show circuit diagrams, graphs, the variation of intensity with time of a guided spark obtained from a rotating mirror photograph, the results of experiments at Unterlüss with a 7.5 projectile, with a velocity of about 350 meters per second.

PB 25210. KÜSTERS, H. Triple prism-recorder (for optical recording of displacement-time diagrams). (BIOS Halstead Exploiting Centre Rept 5304) n. d. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
An apparatus using triple prisms and a recording camera to record the recoil motion of machine guns is described in this report translated by Dr. Traenkle. The optical method using triple prisms as illuminating marks on the weapon was chosen as objections existed against mechanical writers and electrical recording by means of an available string oscillograph. Sketches are included.

PB 22729. METZGER, HENRY, tr. Description and operating instructions for the 24-volt drive motor for aerial cameras in carrying case Fl 38020. (AAF ATSC T-2 Translation 458) Dec 1945. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
This manual translated from the German describes the drive motor, its installation, operation, and maintenance. It is a 24v d-c motor designed to drive the camera mechanism and to control the interval between exposures for successive pictures. Diagrams and photographs illustrate the manual.

PB 8699. TELEFUNKEN GESELLSCHAFT FÜR DRAHTLOSE TELEGRAPHIE M.B.H., BERLIN. Irisblende für optische geräte. (Iris for optical devices) German patent application T 56 345 IX a/42h Oct 17, 1941 still pending. Original inventor: Hawel. 1941. 6 p. Price: Microfilm - 50¢ - Photostat - $1.00
Drawing included.

PB 25028. ZEISS (CARL), JENA. Apparatus for diminishing the reflection in optical instruments (T - apparatus). (BIOS Halstead Exploiting Centre Rept 509) n. d. 39 p. Price: Microfilm-50¢ - Photostat-$3.00
This translation of a Carl Zeiss manual TA 42 was made by R. Harmsen. The manual describes the main components of the T-apparatus, provides explanatory diagrams of all parts of the apparatus and gives instructions for operating and maintaining the equipment. This apparatus is designed to diminish the reflection on optical surfaces so that the contrasts and the intensity of light are augmented. This is accomplished by applying to the surface of the glass tier layers, which possess a very small index of refraction and a thickness corresponding to a quarter of the length of the light wave. These layers are produced by an evaporation process in super vacuum. Defects that can arise on the apparatus and defects that may appear in the layers are enumerated.

X United States

PB 28552. BRADLEY, L. REED. Studies and investigations in connection with the development of hard protective coatings for optical plastics. (California Institute of Technology report.) (OSRD Rept 4080) Aug 1944. 13 p. Price: Microfilm-$1.00 - Photostat-$1.00
For related work see PB 28544-28550, under Lucas, H. J., and PB 28551, under California Institute of Technology.
This present report bears the sub-title:The development of the scratch test for the determination of the hardness of plastics and minerals with the gramoscope. The work with various styluses using a steel phonograph needle, synthetic sapphire, true sapphire and diamond is summarized. Diagrams of a diamond stylus and a sapphire stylus are given. Tables show the superiority of the diamond over the sapphire regarding dulling of the stylus and compare the resistance to scratching with abrasion number and Moh's scale. Two instruments, the "Abrader" and the "Gramoscope", are compared.

X

PB 28551. CALIFORNIA INSTITUTE OF TECHNOLOGY. Studies and investigations in connection with the development of hard protective coatings for optical plastics. (OSRD Rept 3787) May 1944. 74 p. Price: Microfilm-$2.00 - Photostat-$5.00
This report is part of a series of progress reports covered by PB 28544-28550, under Lucas, H. J. This present report covers work of comparable scope, including the following items: (1) Testing, (a) the wear test, (b) effect of heating

hardened plastic slides, and (c) the abrasion test of minerals; (2) modification of the silicon tetrachloride treatment with oxides of nitrogen, particularly nitrogen dioxide; and (3) ozone treatments of lucite, CHM (cyclohexyl methacrylate), polystyrene and glass. For later report, see PB 28552, under Brantley, L. Reed.

PB 28692. DUNHAM, THEODORE, JR. Report on a device for testing the flatness of film in the A-5 and A-7 magazines under service conditions. (OSRD Rept 6024; NDRC Rept 16.1 - 126) Dec 1945. 12 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report from the Optical Research Laboratory, Harvard University, describes test procedures to evaluate by quantitative methods the average flatness of film under many conditions of temperature and pressure. A film flatness tester was designed for measuring the departure of film from perfect contact with the backing plate in the A-5 magazine, but the unit was not finished, and the desired tests have not been conducted. The report recommends that this film tester be completed, and that a similar but better constructed unit should be made up for the A-7 magazine. The general plan of the testing device is shown in drawings included in the report. A contact print made from a sample negative (two exposures) is also included.

PB 28693. DUNHAM, THEODORE, JR. Report on apochromatic photographic aerial lenses and other optical instruments making use of synthetic fluorite. (OSRD Rept 6020; NDRC Rept 16.1 - 122) Dec 1945. 92 p. Price: Microfilm-$2.00 - Photostat-$7.00
This report from the Optical Research Laboratory, Harvard University, describes investigations of the effectiveness of crystals of calcium, barium and strontium fluorides, combined with American optical glasses, for reducing abberations in long focus aerial camera lenses. Tables, graphs, photographs and design diagrams are included. Complete drawings for mounting of Navy Mark IV APO-periscope objective are also included.

PB 28694. DUNHAM, THEODORE, JR. Report on design and development of lenses for rectification of Metrogon high obliques. (OSRD Rept 6021; NDRC Rept 16.1 - 123) Dec 1945. 56 p. Price: Microfilm-$2.00 - Photostat-$4.00
This report from the Optical Research Laboratory, Harvard University, describes the development of a simple lens for use in a rectifying camera which considerably improves the resolution obtained with a pin hole. It also describes the design of a special hypergon lens which gives excellent definition over the whole of a print, rectified at 60° from the vertical, made from a 9" x 9" Metrogon negative. Tables, graphs, photographs and drawings are included.

PB 24865. HILL, G. ALBERT and others. Apparatus and methods for the study of photoflash bomb explosions. Final report. (OSRD Rept 6333) Nov 1945. 49 p. 49 p. Price: Microfilm-50¢ - Photostat-$4.00
The techniques developed at Wesleyan University under contract with NDRC for the study of photoflash bomb explosions represent a compilation and adaptation of methods already in use. While the apparatus is not described in full, sufficient detail is given to permit a worker in the field to design a similiar instrument suited to his own needs. The experimental technique involved is described in more outline with more emphasis on errors to be avoided than on actual procedure. Theoretical material presented is largely derived from the more popular literature dealing with the various subjects treated which include photographic photometry, spectrophotometry, photometry with the oscillograph, the measurement of temperature, the drum photometer and high speed photography of flashes. Graphs, wiring diagram and photographs are included.

PB 28544 - 28550. LUCAS, H. J. Studies and investigations in connection with the development of hard protective coatings for optical plastics and glass. Progress reports: Monthly, bimonthly and final reports. (OSRD Rept 1335, 1483, 1575, 1710, 1849, 1956, 4119) Mar 1943-Nov 1944.

PB No.	OSRD Rept.	Date	Pages	Micro-Film.	Photo-stat
PB 28544	1335	Mar 1943	20	1.00	2.00
PB 28545	1483	May 1943	26	1.00	2.00
PB 28546	1575	Jun 1943	27	1.00	2.00
PB 28547	1710	Jul 1943	9	1.00	1.00
PB 28548	1849	Aug 1943	28	1.00	2.00
PB 28549	1956	Oct 1943	54	2.00	4.00
PB 28550	4119	Nov 1944	78	2.00	6.00

These reports describe the results of work under contract OEMsr 657 with the California Institute of Technology. Studies were made to determine the nature of the surfaces of plastics. Methods were developed for measuring the hardness of relatively soft materials of the class of synthetic plastics, and means of depositing a thin, hard, transparent, siliceous layer on plastics were found. In the final report, a detailed description is given of the best method developed for producing this film. The method consists of exposing the plastic alternately to water vapor and to a mixture of silicon tetrachloride and ozone. It is possible to harden lucite so that it will resist normal wear for more than twenty to thirty times as long as untreated lucite. The method shows promise for other plastics including cyclohexyl methacrylate and polystyrene. The various chapter headings of the reports include: The abrasion test for hardness; the abrasion number hardness scale; the temperature test of treated plastics; changes in water content of plastics under different conditions; effect of liquid compounds on lucite, cyclohexyl methacrylate, and polystyrene; optical properties of silica films; silicon tetrachloride treatment; treatment of plastics with aluminum compounds; studies on the polymerization of acrolein; recommended method of obtaining hard film with silicon tetrachloride and ozone; attempts to form hard film in other ways. Tables, graphs, photographs of wear tests, and a description of the apparatus for producing the film are included.

PB 28540. MIHALYI, J. and BISHOP, F. M. Production design of high-speed anti-glare shutter. Progress report. (OSRD Rept 3413; NDRC Rept 16.1 - 37) May 1943. 14 p. Price: Microfilm-$1.00 - Photostat-$1.00
This report summarizes the work done by the Eastman Kodak Company in developing a shutter for use on night binoculars with anti-oscillation mounts. These units were installed in P-61 aircraft to prevent the pilot from losing his dark adaptation as the result of flares. The shutter was developed to close the aperture of the binoculars within .001 seconds and to remain closed for approximately 0.3 seconds. Photographs and diagrams illustrate the report. See also PB 28540.

PB 28699. MIHALYI, J. and HARVEY, D. C. High-speed anti-glare shutter production design. Final report. (OSRD Rept 4446; NDRC Rept 16.1-64) Sep 1945. 34 p. Price: Microfilm-$1.00 - Photostat-$3.00
This publication contains two progress reports. The report of May 24, 1943 states that a new production design of Dr. Morey's anti-glare shutter (for aircraft binoculars) with the recoil mechanism operating downward had been started. The report of February 8, 1944 describes the production model which had been completed December 1, 1943. Photographs of the completed shutter and layout drawings are included. See PB 28699 for additional material.

PB 28700. MILLER, CARL W. and BECK, LLOYD H. The effects of night binocular design features on the visibility of targets at low levels of illumination. (OSRD Rept 6128; NDRC Rept 16.1 - 150) Oct 1945. 103 p. Price: Microfilm-$3.00 - Photostat-$7.00
This report describes the second investigation of this project, carried out at Brown University. The first investigation was carried out at the Dartmouth Eye Institute, and the results described in OSRD Rept 4433, entitled "The effects of binocular magnification on the visibility of targets at

low levels of illumination". The present report presents data on the relative advantages, at night sky illumination levels, of exit pupils of 2, 4, 6, 8 and 10 mm. in binoculars of 5X magnification. The program at Brown University included also studies of the visibility of targets of reduced contrast, the effect of duration of target exposure, monocular vs. binocular vision and several other problems. These are reported in Section VI of this report. Three appendices present data on the following: I. Variables affecting the night-vision detection of targets; II. Elementary optical theory of binocular performance; III. Analysis of reduced contrast studies. Photographs, tables and graphs are included. The data on which this report is based may be found in OSRD Rept 6129 (PB 28701).

PB 28701. MILLER, CARL W. and BECK, LLOYD H. Summary of experimental data, a supplement to OSRD report no. 6128 entitled: The effects of night binocular design features on the visibility of targets at low levels of illumination. (OSRD Rept 6129; NDRC Rept 16.1 - 151) Oct 1945. 169 p. Price: Microfilm-$4.00 - Photostat-$12.00
This report gives in tabular form the complete record of right and wrong choices made by each observer when judging the location of a target of a given size with or without the aid of binoculars. These data form the basis of the final report of Brown University under contract OEMsr-1227 entitled "The effects of night binocular design features on the visibility of targets at low levels of illumination" (OSRD Rept 6128, PB 28700).

PB 25889. OSBORN, W. H. Roasting garnet superfine flours. Final report, Oct 1, 1943 - Oct 24, 1944. (War Metallurgy Committee Res Rept W-159) Nov 1944. 17 p. Price: Microfilm-$1.00 - Photostat-$2.00
Due to the shortage of natural corundum and artificial abrasive superfine flours for such applications as the grinding of ophthalmic and precision lenses, garnet flour superfines have been tried as a substitute. Recent work in the roasting of garnet abrasive grains used in pressure blasting led to the belief that roasting of superfine flours for use in lens grinding would improve their qualities. Consequently, various samples of classified and unclassified garnet flours were roasted at varying temperatures under oxidising neutral and reducing conditions in a rabble arm type roasting unit. Samples of these roasted products were sent to the Eastman Kodak Company, Bausch and Lomb Company, and the American Optical Company. In all cases, negative results were obtained. Therefore, it was concluded that no benefit would be obtained in the use of these garnet fines by roasting them. Appendices contain minutes of meeting of project committee, summary of roasting tests, and reports on grinding tests. This work was done by the Phelps Dodge Corporation under contract with the War Production Board.

PB 27445. SHAW, F. B., JR. and BENJAMIN, L. Applications of X-ray in the design and inspection of CWS material. n. d. 18 p. Price: Microfilm-$1.00 - Photostat-$2.00
The use of X-rays for detection of defects in chemical warfare materials is outlined. Eight photographs illustrate how to detect cavities in casings, displacement of internal components, faulty filling of shells, poor tolerance or fitting of metallic shell parts, and position and volume of chemicals or masses in mixtures.

RUBBER AND RUBBER PRODUCTS

German

PB 23858. BRAZIER, S. A. and others. German general rubber goods industry. (BIOS Final Rept 349, Item 22). Oct 1945. 263 p. Price: Microfilm-$3.00 - Photostat-$18.00
To gather information on the German rubber goods industry the following factories were visited and a statement as to their condition reported: Continental Gummiwerke, Nordhafen, Hannover; Continental, Limmer, Hannover; Continental, Vahrenwalderstrasse, Hannover; Harburger Gummiwaren Fabrik "Phoenix", bei Hamburg; New York-Hamburger Gummiwaren Fabrik, Harburg; Weber & Schultz, Barenfeld, Hamburg; H. Rost & Co., Hamburg; Tretorn Gummi & Asbestwerke, Hamburg; I. G. Farbenindustrie, Leverkusen; Franz Clouth Rheinische Gummiwaren Fabrik, Cologne; Carl Plaat Gummiwaren Fabrik, Köln; Kölnische Gummifaden Fabrik, Köln Deutz; und Hadium Gummiwaren Fabrik, Dellbrück, Köln. Technical information is presented on the manufacture of rubber conveyor and transmission belting, latex, ebonite, footwear, hose, plastics, soles and heels, sponge, surgical products, thread, and tires. The processes involved in the treatment of rayon, reclaiming, mill procedure, and rubber to metal banding are described. Drawings, photographs, graphs, and tables are included, as well as glossaries of compounds and compounding ingredients.

PB 17640. I. G. FARBENINDUSTRIE. Alterungsschutzmittel 4010. (Anti-oxidant 4010) (Enlargement print of part of microfilm 185-2) Mar 1939. 9 p. Price: Microfilm-50¢ - Photostat-$1.00
This anti-oxidant was especially developed for the protection of tires, conveyor belts, and certain cable jackets against fatigue cracks. It does not provide protection against aging through sun-exposure but may be mixed with paraffin and ozokerete. The claim is made that this product is superior to all others including American products based on phenyl-betanapthylamine and diphenyl-p-phenylenediamine. Product 4010 replaces in whole or in part the use of phenylalpha-napthylamine and phenylbetanapthylamine. The results of testing are given in tabular form. In German.

PB 19331. I. G. FARBENINDUSTRIE. Applications of perduren G und H. (Applications of Perduren G and H) (Enlargement print of part of microfilm 185-2) Aug 1937. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
Directions are given for the preparation of a Perduren G and H vulcanizable hard rubber which can be used in the production of rolls, formed bodies, and benzene and oil proof hose. In German.

PB 17606. I. G. FARBENINDUSTRIE. Comparison of Vulkacit AZ with other accelerators. (Enlargement print of part of microfilm 185-2) Oct 1937-May 1939. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
The material consists of a set of tables showing test results of various vulcanizates. In German.

PB 17636. I. G. FARBENINDUSTRIE. Diorthotolylguanidin bezw vulkacit DOTG. (Diorthotolylguanidine or vulkacit DOTG) (Enlargement print of part of microfilm 185-2) Nov 1939. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
DOTG is used in the same way as vulkacit D. Its special properties can be seen by a detailed table of comparison. In German.

PB 17632. I. G. FARBENINDUSTRIE. Herstellung von isopren in der "Merling" - apparatur O 106. (Preparation of isoprene in the "Merling" -apparatus O 106) (Enlargement print of part of microfilm 178-1) 22 p. Price: Microfilm-50¢ - Photostat-$2.00
Detailed description for a laboratory preparation of isoprene is given which is divided into two phases, the preparation of an A-product and its reduction into a B-product. Starting materials for the A-product are ether, sodium amide, and acetylene. Decomposition is effected by glacial acetic acid. After removal of the ether, the raw A-product is submitted to fractional distillation. To obtain B coppered zinc dust is used. Ten diagrams, four graphs and one flow-scheme are attached. In German.

PB 17637. I. G. FARBENINDUSTRIE. Oxydwachs. (Oxide wax) (Enlargement print of part of microfilm 185-2) Mar 1938. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
Oxide wax, a bright yellow material with a softening point of about 40°-50°C, facilitates the treatment of high-grade rubber mixtures in sprayers and calenders. It acts as an accelerator.

PB 17631. I. G. FARBENINDUSTRIE. Prüfung von gummi. (Testing of rubber) (Enlargement print of part of microfilm 178-1) Dec 1940. 1 p. Price: Microfilm-50¢ - Photostat-$1.00
Description of a standard procedure to determine the elasticity of soft rubber with the help of a pendulum hammer type Schob.

PB 16330. I. G. FARBENINDUSTRIE. Prüfung von verklebungen, gemäss DRP 734 493 vom 29.4.43. (Testing of adhesive properties according to German patent No. 734493 dated Apr 29, 1943) (Enlargement print of part of microfilm 182-5) Jun 1943. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
Detailed description of 4 different tests are given. In German.

PB 17616. I. G. FARBENINDUSTRIE. Verfahren zur herstellung von künstlichem kautschuk. (Method of producing synthetic rubber) (Enlargement print of part of microfilm 185-1) Aug 1942. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a patent application by I. G. Farbenindustrie. The claim is for the preparation of synthetic rubber by polymerizing a mixture of butadiene and the methyl estes of methacrylic acid in a neutral or acid medium at temperatures of about 25°. Polymerization is brought about by the addition of small amounts of peracids or their salts and then the gradual addition of H202. In German.

PB 16369. I. G. FARBENINDUSTRIE. Verfahren zur herstellung von leicht verklebbaren kautschuk-vulkanisaten. (Method of preparing easily cementable vulcanizates of rubber). (Enlargement print of part of microfilm 182-5) Jul 1941-Dec 1942. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a patent application by I. G. Farben. The claim is for the preparation of a vulcanizate of natural or artificial rubber which is cementable to leather, metals, and other surfaces by the addition to the vulcanization mixture of non-vulcanizable substances which have rubberlike properties and good adhesion. Some of these are polyethylene, polyisobutylene, polyvinylisobutyl ether, polyacrylic acid esters and their mixed polymers.

United States

PB 19850. U. S. ORDNANCE DEPARTMENT. DETROIT. DEVELOPMENT DIVISION. Rayon cord tire carcasses. Nov 1945. 29 p. Price: Microfilm - 50¢ - Photostat - $2.00
Tests were conducted to determine the quality of rayon cord as compared with cotton cord, and to determine the serviceability of the new 2200 denier, 2-ply rayon cord. It was concluded that standard 1100 denier, 2-ply rayon tire cord improves the serviceability of synthetic military tires by increasing bruise resistance and reducing heat failures. Rayon cord is necessary in larger synthetic military tires, size 8.25-20, 10-ply and larger. Rayon cord is desirable in medium size synthetic military tires, but is not needed in smaller tires. Heavy gauge, 2200 denier, 2-ply rayon cord, using reduced number of plies, is equal to light gauge 1100 denier, 2-ply rayon cord. Appendices contain correspondence relating to this problem and numerous test sheets.

TEXTILES AND TEXTILE PRODUCTS

British

PB 22415. WARD, KYLE, JR. Shirley Institute, Manchester, England. (FIAT Final Rept 209) Sep 1945. 8 p. Price: Microfilm - 50¢ - Photostat - $1.00
This publication contains information about the Shirley Institute which is supported by the British Cotton Industry, and is concerned with every stage in the manufacture of cotton fabric. The Institute is also devoting special attention to abrasion and wear properties of rayon and is conducting some research in silk. Dr. J. C. Withers provided additional information about certain German fiber targets. Talks with individuals at the Institute covered recent advances in the investigation of the oxidation of cotton cellulose, the chemical analysis of modified cottons, the dye absorption of cottons, the physical testing of cotton products, flexure and abrasion, the use of the electron microscope and the applications of the ultra-centrifuge to cotton work.

German

PB 24944. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Preliminary reports list no. 177. Jan-Feb 1946. 14 p. Price: Microfilm-50¢ - Photostat-$1.00
Summaries of reports nos. 3433-3448, in tabular form, giving names of German firms and persons, locations, principal products, condition of plants, and machinery. Includes reports on the following: Textile manufacturing and finishing plants: Hermann Windel, Bielefeld; Kuhn & Vierhaus and August Dixthey Söhne, Rheydt-Mulfort: M. G. Gesellschaft für Färberei & Druckerei, Gladbach; Schusterinsel A.G., Opladen; Schwartz & Klein, München-Gladbach (cloth manufacture); Leo Sistig, Krefeld; Franz Müller Maschinenfabrik, München-Gladbach; Pongsu Zahn Textilwerke, Viersen; Fischer-Furventsches & Söhne, Dulken; Carl Zangs, Krefeld; Maschinenfabriken Gerber Söhne & Gebrüder Wanseleben, Krefeld; A. Monforts Maschinenfabrik, München-Gladbach; Gebrüder Roeders A.G., Soltesu bei Hannover(pressed woolen felt manufacture); Fischery & Maden, Aachen (felt for card clothing foundations); and Bossbach & Klein, bei Aachen (felts for card clothing foundations).

PB 27730. BROADBENT, ELLIOT and others. The textile printing industry in Germany. (QM Textile Series Rept 20) May 1946. 67 p. Price: Microfilm - $2.00 Photostat - $5.00
The German printing industry as a whole has been slow to try out new chemical processes. Consequently, the most advanced ideas developed by the I.G. Farbenindustrie have first been put on a practical basis in other countries. Mechanical advancements on the other hand are quickly taken up by the Germans. For instance, most plants are equipped with tenter frames, jigs and padders of the latest design. Dye kettles or reels are for the most part of excellent design and most plants have put on covers to save steam and improve working conditions in the dye house. Production in print plants is extremely low. New aids to printing which are worthy of note are the Flu-Tex light, and the spiral doctor blade, although will probably not find ready acceptance in the U.S. according to the report. The use of Rapidogen Developer N and NN is also interesting. The vacuum strainer is used in some U.S. plants but has not had wide acceptance. The speed at which it functions makes it a desirable help in the color shop. The single roll mill is also a valuable addition to color shop equipment. The coverings on dye boxes are better than the design used in the U. S. inasmuch as better visibility for the operator is made possible. The Pigment white discharges on dark grounds are generally much poorer than similar work in the U.S. More use is made in Germany of the insoluble Azo colors in printing blotches on rayons and on bemberg sheers. The appendices (p. 17-46) contain reports from the following plants: Württemberg Kattun Manufactur, Heidenheim; Neue Augsburger Kattun Fabrik, Augsburg; Baumwollindustrie Erlangen-Bamberg A.G., Wangen; Gabrial Herose A.G., Constanz; Guntramsdorf Druckfabrik A.G., Vienna; and Vereinigte Färberei A.G., Vienna. The first four plant reports may also be found in PB 27732. Other materials in the appendices (p. 47-64) are: Development of Anthrasol direct prints after the nitrile process on spun viscose mualinet; tests of advertising circulars on the Flu-Tex lamp, vacuum filter equipment, and single roller mill; and resists on dress goods patterns under Indigosols and under deep shade vat dyes. Formulae, photographs and sketches of equipment are included.

PB 17325. I. G. FARBENINDUSTRIE. Lieferbedingungen für dichtungsbahnen aus oppanol (Specifications for oppanol coated textiles). (Enlargement print of part of microfilm 180-2). Sep 1942. 5 p. Price: Microfilm-50¢ - Photostat-$1.00
These are the specifications of a textile coated with oppanol (polyisobutylene). Specifications cover dimensions, packing, resistance to heat and cold, resistance to tearing, to water, to chemicals, etc. In German.

PB 27732. JACKSON, GLENN D. German methods for finishing rayon fabrics. (QM Textile Series Rept 21) May 1946. 73 p. Price: Microfilm - $2.00 - Photostat $5.00
This report is one of a series prepared by a "Textile Finishing Team" which was organized to explore German developments in the field of textile auxiliaries and finishing agents. In it the following subjects are treated: (1) Some aspects of rayon and synthetic fabric dyeing and processing in Germany and Austria; (2) producing durable embossing on rayons and a machine for coloring embossed fabrics; and (3) a German finish of spun rayon fabrics combining water repellency, crease-resistance and low residual shrinkage. Reports, documents and interviews obtained by the Textile Finishing Team from which this report was prepared are appended (p. 15-70). These include sketches and photographs of equipment, formulae, translation of a paper on "vat acid" process, letter by I.G. Farben on dyeing Astrazon colors and reports on the following plants: Württembergische Kattun Manufaktur at Heidenheim; Neue Augsburger Kattun Fabrik at Augsburg; Gabriel Herose A.G., Constance; Baumwollindustrie Erlangen-Bamberg Bleicherei, Färberei und Aporetur Anstalt Uhingen A.G. and Calico- und Kunstleder-Werke at Goppingen, Württemberg. The first four plant reports may also be found in PB 27730. Dyeing equipment was found to be particularly well designed but their decks were too small for our larger production lots. A novel arrangement of pads, jigs and quetsche in one plant is reported. Newer dyestuffs of I.G. Farben had found little use in the trade due to the war. Since Perlon was relatively new, acetate dyestuffs were still in use.

PB 18429. LAUER, KARL. Forschungsauftrag 'Alkalicellulose' (Research project "alkali cellulose") (Institut für chemische Technologie synthetischer Fasern). (ALSOS Mission, EFR 303). Jul 1944. 26 p. Price: Microfilm-50¢ - Photostat-$1.00
Decomposition, pre-ripening, xanthogenization and filtrative capacity of alkali celluloses (birch, pine, beech, straw) were studied; furthermore, average degree of polymerization, heat of adsorption, dye absorption, and swelling were determined. The results of these experiments are presented in six tables, three figures, and three sheets of graphs. Nineteen photographs show the treated and untreated material. In German.

PB 27125. SCHIEFER, HERBERT F. and KROPF, RICHARD T. The German sewing thread industry. (FIAT Final Rept 710) Jan 1946. 37 p. Price: Microfilm - $1.00 - Photostat - $3.00
This report consolidates reports made by the authors and issued as FIAT final reports, mimeographed for limited distribution. The first section is a summary of the industry as whole (FTR-315). The German sewing thread industry produced a total of approximately 8,000,000 kilograms of thread products per year amounting to an annual sales of approximately 100,000,000 marks. During the war the production and sales were approximately 150% of normal. Normally the products consisted of sewing threads, darning threads, and art needle threads produced from cotton, linen, silk, and rayon. During the war cotton was cut off and threads were made primarily from spun rayon and from high strength rayon as well as smaller quantities of linen and silk. The production methods and equipment used throughout the industry are quite conventional, and follow the usual designs. The distribution and sales of the industry is primarily handled by sales syndicates. It is estimated that these syndicates handle 90% of the business. The German thread industry has not sponsored fundamental or applied research. When such work has been required, it has been referred to outside organizations. Some research has been done, however, and outstanding research has been presented briefly in the second section (FTR-307). Sections 3-9 cover the following manufacturers: Albert Aug. Knapp at Pfullingen (FTR-304); A.G. Mez, Freiburg (FTR-305); Zwirnerei Ackermann, A.G., Sontheim (FTR-308); A. Schredin & Co., Reutlingen (FTR-309); Amann & Söhne, Bönnigheim (FTR-310); Zwirnerei and Nähfadenfabrik Göggingen, A.G., Göggingen (FTR-311); and Gütermann A.G., Gutach (FTR-312). Within the sections are SKR numbers referring to Schiefer-Kropf Reports, listed in full in Appendix III. Appendix I consists of notes on personnel, Appendix II is a government regulation and Appendix IV a bibliography of available documents and list of samples.

PB 22425. SMITH, JULIAN F. Textile research and education, Wuppertal-Barmen. (FIAT Final Rept 322) Oct 1945. 4 p. Price: Microfilm - 50¢ - Photostat - $1.00
The object of this report was to obtain an outline of the textile research and educational work done at Höhere Fachschule für Textilindustrie and Otto Budde Company, Wuppertal-Barmen, Germany. The records of the school were all destroyed, but most of the research work had been published in textile periodicals. This report covers topics studied by Otto Budde & Co. as well as by the school since the main interview was with Dr. Zierach. He is a member of the Kuratorium of the school and a part owner of Otto Budde & Co. Part of the report is in English and part in German.

PB 27824. SMITH, THOMAS R. The dyeing of spun rayon and rayon filament yarn in mechanical apparatus in Germany. (FIAT Final Rept 645). Dec 1945. 19 p. Price: Microfilm-$1.00 - Photostat-$2.00
Generally speaking, the machinery for dyeing packages, cheeses and beams in pressure machines in Germany has not advanced as far as in the U.S. with one exception, where rayon cakes have been dyed in a new machine developed jointly by Dr. Diem at the I.G. Farben Rayon Plant in Rottweil and Obermaier and Company of Neustadt on the Haardt, near Mannheim. One new method of vat-dye application, known as the "Kuspensesure" developed by I.G. for the dyeing of vat colors on rayon, both spun and filament, is given in detail in Appendix 2. Formulas are included.

Japanese

PB 27648. ROSWELL, HOMER L. Portion of Japanese horse protective cover. (CWS 42nd Chemical Lab Co. Captured Material Tech Rept 31). May 1944. 6 p. Price: Microfilm-$1.00 - Photostat-$1.00
That portion of a protective cover for a horse designed to cover the animal's forequarters and apparently designed to protect the horse from contamination with liquid blister gases dispersed by aerial spray attacks is described. It is made of an impermeable material of a basic fabic of cotton cloth rubberized. Photographs are included.

United States

PB 27728. BARNES, W. R. Tent design and construction. (QM Textile Series Rept 15; QM Tent Res Rept 1). May 1946. 110 p. Price: Microfilm-$3.00 - Photostat-$8.00
This study conducted at the Institute of Industrial Research at the University of Louisville under contract with the National Research Council was the result of reports of tent failures from the Pacific early in the war. It is a study of the structural principles involved, particularly of the stresses and strains which develop in a textile fabric when employed as a tent roof, as a basis for re-design of the M-1942 squad tent. It also includes other phases such as

the problem of heating and ventilation in tents. It consists of the following sections: I. Structural stresses and strains in tents, by W. R. Barnes. II. Load-elongation-time curves of cloth, webbing and rope, by G. W. Williams; temperature control in tents by R. L. Harvin. Comments by Rogers B. Finch. Drawings, photographs and graphs illustrate the study.

PB 23002. FINKELNER, A. J. Camouflaged shelter halves; and supplement dated Aug 1943. (Marine Corps Equipment Bd Test Rept Project 94) Jun 1943. 5 p. Price: Microfilm - 50¢ - Photostat - $1.00
Two samples each of Standard Army, 8 oz. duck, herring bone twill, balloon cloth and balloon cloth substitute, and five samples from the Depot of Supplies of celanese, special wax-like, rubberized, windbreak and water resistant cloths were tested. Test procedure included a mildew test, weather and fading test of shelter half, and weather and fade test of cloth. The balloon cloth and balloon cloth substitute seemed to have lost a great deal of tensile strength. The balloon cloth shelter halves, vat and pigment dyed and the rubberized cloth shelter half, were torn badly during a windstorm as the material had become weakened by wind, rain, and very hot sun. The windbreaker cloth shelter half showed a faint mottled appearance at conclusion of test, cause remains unknown. A supplementary test showed that the camouflaged shelter halves printed with vat dyes, when exposed to all types of weather, faded more rapidly and thoroughly than the shelter halves printed with pigment dyes. Results are presented in tabular form.

PB 27731. MILLER, DAVID H. Temperature and humidity conditions encountered in exposure of tents. (QM Textile Series Rept 16; QM Tent Res Rept 2). 1945. 49 p. Price: Microfilm-$1.00 - Photostat-$4.00
More than in any other type of textile usage, fabrics used in tents are subject to the destructive elements of weather. The effects of weather predominate over all other causes in the failure of tentage material. The Quartermaster Board at Camp Lee, Virginia made three types of observations which are analysed and discussed in this report: (1) Observations in the open air; (2) observations inside the tents; and (3) temperature in the fabrics themselves. A total of 1350 primary observations were made daily including measurements taken from automatic recording graphs. Wind, rain, temperatures and humidity were measured. Results are presented in graphs and tables, and photographs accompany the report.

PB 23001. MONVILLE, L. G. Suit, camouflage, made from Fortisan yarn material. (Marine Corps Equipment BD Test Rept Project 95) Jul 1943. 2 p. Price: Microfilm - 50¢ - Photostat - $1.00
Subject suit was composed of trousers, blouse, and helmet cover, printed in an improved camouflage pattern. Tests showed that the suit was light, did not cling to the body when sweaty, and due to ventilation of the suit body perspiration dried without saturating the garment. Man did not feel chilled as weave of garment is such that it acts as a wind break. When the suit was washed in water, it dried out quickly and showed no ill effects. Material is a very fine netting from same yarn as used in parachutes with a very high tensile strength.

PB 28376. WRIGHT, THEODORE R. and others. Impermeable mittens. (CWS 45th Chemical Lab Co. Tech Rept 51). May 1945. 11 p. Price: Microfilm-$1.00 - Photostat-$1.00
Seventy-five pairs of oilskin protective mittens, one finger type, were given visual inspection and vesicant penetration tests. Twenty-five percent of the mittens examined were found to have defective seams caused by needle holes, broken threads, and torn places. The material of the mittens was found to compare favorably with similar material of American manufacture, with regard to tensile strength and mustard penetration. The seams were found to offer little protection against mustard penetration. Mittens in good condition at the seams used in conjunction with impregnated gloves were found to give protection for 30 minutes. From experiments with white rats the unsewed mitten samples gave protection from liquid mustard for periods up to 51 minutes, while sewn samples gave only partial protection at 2 minutes and none after 5 minutes. Test results are presented in tabular form.

TRANSPORTATION EQUIPMENT

AERONAUTICS

Aircraft

PB 25217. DIEM, M. Contributions to the problem of ice formation. (AAF ATSC T-2 Translation F-TS-553-RE) Feb 1946. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
This is a translation of the German report "Beitrage zur frage der Vereisung." Forschungsbericht Nr. 1482 Deutsche Forschungsanstalt für Segelflug. October 10, 1941. It sets forth experience gained on icing-up flights and gives the measuring methods rendering it possible to measure ice accumulation and to determine the size of the drop-lets in the cloud particles. Photographs, tables, drawings and graphs are included.

PB 22877. ELLIOTT, RAYMOND. Spare parts supply and provisioning in the G.A.F. (CIOS File XXII-69, Item 25) 1945. 6 p. Price: Microfilm - 50¢ - Photostat - $1.00
This report results from the interrogation by T.I.I.C. in the United Kingdom of three officials of the Chef T.L.R.'s department (Technical Air Equipment), namely, Oberstingenieur Helmut Coruda, Chief of the Sub-section Supply; Hauptingenieur Offenhammer and Hauptingenieur Andros, Chief of the Sub-section Quality Control. A review of conditions in aircraft spare parts supply in the German Air Force during the war is presented. The report concludes that the supply system was well-planned but broke down because of deficiencies in both government and industrial personnel. It is also noted that conditions discovered indicate that the German government did not have as tight control over industry as had previously been believed.

PB 22730. HANSEN, ASMUS. Problems of high altitude flying. (AAF ATSC T-2 Translation 459). Jan 1946. 40 p. Price: Microfilm-50¢ - Photostat-$3.00
This translation by the Intelligence Section, Wright Field, Dayton, Ohio, of a lecture delivered October 28, 1937, entitled "Probleme des Höhenflugs" (Schriften der Deutschen Akademie der Luftfahrtforschung Heft 29), places the advantages of high altitude flying in three groups: Increase of speed, augmentation of meteorologic and navigational security, and military advantages. The problems of high altitude research are also subdivided into three main groups: Physiology in high altitude flying, high altitude aircraft, and high altitude power plant. All of these subjects are discussed, and descriptions given of various types of high altitude engines. Drawings, graphs, and photographs are appended.

PB 23598. U. S. ENGINEER BOARD. Photographic report of the projects of the barrage balloon branch from April 1942 to September 1943. Oct 1943. 89 p. Price: Microfilm - $1.00 - Photostat - $6.00
This report covers 99 items of equipment, projects, or work accomplished, and was assembled from the records and files of the Barrage Balloon Branch. It is complete except for 15 items of which neither the item nor photograph of the item was available in time to be included in the report.

Instruments

PB 25084. WITTKE, WERNER. Report on pilotless aircraft by Ing. Werner Wittke, also curriculum of this engineer and introductory letter. (BIOS Halstead Exploiting Centre Rept 5201). Oct 1945. 42 p. Price: Microfilm-50¢ - Photostat-$3.00
This is a translation of a statement made by Wittke. This man had devised a pilotless aircraft controlled by electronic means. Described are the modes of operation and control.

Evidently the most difficult operation was the landing operation. Formulae involved are presented in the document. Wittke claims credit for the invention and requests that he be allowed under United States sanction, to pursue further investigative work to develop the pilotless aircraft. The second part of the report is an autobiography which reveals that Wittke had also done some work at Peenemünde, the German rocket investigative station. Appended are a number of drawings illustrating the modus operandi of the pilotless aircraft.

Engines and Propellers

PB 17594. GERMANY. REICHSLUFTFAHRTMINISTERIUM. Lehrmittel der ausbildungswerkstatt des RLM (A.T.A.) Strassburg. (Training aids for aircraft mechanics). (MIS VII 71c10 702884). Aug 1939. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
The folder consists of a set of sheets which in outline form give all the information on the airplane motor BMW6 taught in a course for aircraft mechanics. The material was prepared in the training schools of the RLM (Reichsluftfahrt-Ministerium) (A.T.A.), Strassburg, and that of the Süddeutsche Bremsen A.G., München. In German.

PB 17686. JOINT INTELLIGENCE OBJECTIVES AGENCY. Prof. F. A. F. Schmidt's book "Verbrennungsmotoren. Thermodynamische und versuchsmässige grundlagen unter besonderer berücksichtigung der flugmotoren" (Internal combustion engines. Thermodynamic and experimental principles with special consideration of airplane engines). 35 mm. microfilm. Jan 30, 1946. 214 p. Microfilm-$3.00
This book is essentially a discussion of Otto and Diesel engines. Part A treats general engine problems and part B the special problems of aircraft engines. Each part is further subdivided: A(I) thermodynamics of idealized engine cycles. A(I)2 review of phenomena within the cycles. A(I)3 a study of the essential factors for efficient engine operation (includes theoretical considerations and experimental data on the effect of mixture ratio, compression and ignition). Section A(II) is entirely devoted to the subject of supercharging. The separate treatment of aircraft engines in Part B reflects the complexities arising from operation at changing altitudes. Section B(I) concerns nonsupercharged aircraft engines, B(II) supercharger system driven directly by the motor. Section B(III) discusses the exhaust gas turbo supercharger. Section B(IV) presents a discussion of the suitability of different engine systems for different types of aircrafts and some important relations between engine power and flight performance. Appendix I and II contain some examples of numerical calculations and a treatise on thermodynamic functions. The supplement deals with the results of researches between 1940 and 1945. Research on ignition is particularly emphasized. The supplement also contains a brief treatment of the thermodynamics of gas turbines. Additional supplements to individual pages of the book are found. A bibliography and subject index is added. Finally five graphs of completely calculated thermodynamic functions of combustion gases of engine fuel are given. The book is fully illustrated with drawings, photographs and graphs. Photoprints will not be available from this film, but enlargement prints will be made at a later date and both microfilm and photoprint copies will be available.

PB 37056. SIMMONS, W. J. Report on Maybach Motorenbau G.m.b.H. (CIOS File XXIIII-8, Item 18). n.d. 40 p. Price: Microfilm-$1.00 - Photostat-$3.00
The Maybach plant of Friedrichshafen is of particular interest as it is the parent organization for the power units fitted to the bulk of German A.F.Vs. A considerable amount of technical information was obtained from Dr. Maybach which was supplemented later by the interrogation of one of his engineers, Von Kienlin, who was responsible for the development of the H.L.234 engine. Further details of this engine in the form of drawings, power curves, etc. were obtained from the firm's experimental plant at Shornreute near Ravensburg, and are included in this report. The H.L. 230 engine is a carburetor engine of 130 x 145 bore and stroke with 700 I. H.P. at 3000 R.P.M. and the H.L.234 is similar but is of the petrol injection type.

Maintenance and Repair

PB 16588. MEISELMAN, S. Test of straight threaded universal fittings at 1500 and 3000 PSI hydraulic pressure. (AAF Materiel Command Memo Rept ENG-51-AD1058, Addendum 13). Feb 1944. 16 p. Price: Microfilm-50¢ - Photostat-$2.00
Results are reported of 1500 and 3000 PSI universal fitting tests conducted on AN902 gaskets of standard cross-sectional area, AN902 gaskets with a 25 percent increase in cross-sectional area, and AN6227 O-ring hydraulic packings used in place of the AN902 gaskets. The methods and details of the test are described in appendices.

Training and Training Devices

PB 23727. COLUMBIA UNIVERSITY. APPLIED MATHEMATICS GROUP. On the orientation and magnification of an airplane model for movies. (Memo 35; OSRD Rept 1879; NDRC Applied Math Panel Rept 40.1). Sep 1943. 39 p. Price: Microfilm-50¢ - Photostat-$3.00
This report gives a proposed computational procedure to devise improved methods for the calculation of the magnifications and orientations of an airplane model when used in making movies which will simulate aspects of air warfare. The Jam Handy Organization which makes the movies has analyzed the problem and made computations. Their theoretical treatment was found good, but this report proposes alternative computational procedure that may cause a 20% reduction in time or a reduction from 118 to 91 operations. The proposed computational procedure involves the solution of certain spherical triangles by five suggested methods. Appendices give some calculations and describe the celestial coordinator and the spherimeter and their principles of operation. Drawings are included.

Airports and Airways

PB 18531. U. S. WAR DEPARTMENT. Aviation engineers. (Tech Manual 5-255) Apr 15, 1944. 479 p.
Available from Supt of Docs, Washington 25, D.C., price $1.00
The work of aviation engineer units consists primarily of construction, maintaining, defending and camouflaging airdromes. This manual covers both tactical and technical phases of their training and operations with special reference to their employment in theaters of operations. It is designed to be used as a reference handbook as well as a text for training purposes. Part one provides a general background of the mission, organization and training of units. Part two covers all phases of airdrome construction. A bibliography and other technical and reference data are contained in six appendices. Drawings and photographs illustrate the manual. Several photographs are in color which will not reproduce.

Aerodynamics

PB 23707. DAY, M. M. and FRAGER, W. The aerodynamic pursuit curve. (NDRC Applied Math Panel Memo 106.1M; Brown Univ Applied Math Group Memo 31M). Jul 1944. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
The aerodynamic pursuit curve is the path followed by a fighter plane when it is attacking a bomber. Differential equations for the curve are derived under the assumptions that: (1) The fighter is moving under the influence of the force of lift, drag, cross-wind force, weight and propeller thrust, (2) the bomber is flying a straight horizontal course at constant speed, (3) the fighter pilot maneuvers to keep his gun pointed constantly toward the bomber. Drawings are included.

PB 23729. FRIEDRICHS, K. O. On configurations involving three shocks through one point modified by Meyer waves. (NDRC Applied Math Panel Memo 38.9; New York Univ Applied Math Group Memo 21). Sep 1943. 7 p. Price: Microfilm-50¢ - Photostat-$1.00
The writer reports on an investigation of possible configurations involving three shocks through one point and Meyer waves. A variety of such configurations was found but so far it does not seem that these modified Mach configurations can serve to explain a continuous transition of regular reflection into Mach reflection for weak shocks. The paper is illustrated by diagrams.

PB 23706. HANDELMAN, G. H. and FRAGER, W. Aerodynamic pursuit curves for overhead attacks. (OSRD Rept 4019; NDRC Applied Math Panel Rept 106.1R; Brown Univ Applied Math Group Rept 6R). Aug 1944. 62 p. Price: Microfilm-$1.00 - Photostat-$5.00
This report is concerned with the study of the aerodynamic pursuit curve followed by a fighter plane during an overhead approach in order for the gunner in a bomber to make the proper deflection in aim to defend his plane against the fighter attack. It is assumed that the bomber flies along a straight horizontal line at constant speed and that the entire attack takes place in a vertical plane. In this way we can examine the effects of aerodynamic forces on the pure pursuit curve. Section 1 contains the development of the equations of motion, including the forces acting on the fighter, as well as the pursuit conditions. In Section 2, it is shown that these equations can be reduced to a system of 4 nonlinear differential equations of the first order which define the variation with time of the following variables: true air speed, angle of attack, angle of glide of the fighter and range from the fighter to the bomber, plus three dimensionless variables. Section 3 discusses the indeterminacy of the gunner's estimation of the initial angle of attack. Section 4 is devoted to the study of the results obtained by integrating the fundamental equations in the case of a P-47 attacking in the 10,000' altitude range. Appendix A describes a process for the calculation of the coefficients appearing in the differential equations from the description and performance data. Appendix B discusses the construction of nomographs. Nomographs, curves, tables and errata sheets are included.

PB 23731. WEYL, HERMANN. A scheme for the computation of shock waves in gases and fluids. (NDRC Applied Math Panel Memo 38.7M; New York Univ Applied Math Group Memo 18) Jul 1943. 28 p. Price: Microfilm-50¢ - Photostat-$2.00
Temperatures in shock waves mount so high that the assumption of constant heat, or, what amounts to the same, of the linearity of the function f which expresses the energy U per mol in terms of temperature, is only a rough approximation. In this report f is treated as an empirically given function. In order to obtain a clearcut algebraic algorithm one is then forced to express everything in terms of the temperature. Ideal gases and fluids which obey Tammann's equation of state can be tackled by exactly the same scheme.

Rockets and Jet Propulsion

British

PB 25820. ARNDTM, ALBERT A. Some notes on British jet engine manufacture. (AAF AMC Air Tech Intelligence Review Rept F-IR-4-RE). May 1946. 40 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report describes impressions gained by the author during a recent tour through various prominent jet engine establishments in England. This tour had been arranged by the British Ministry of aircraft production at the request of A-2, USAFE and was undertaken during the early part of November 1945. The purpose of the mission was to obtain an overall picture of manufacturing methods and trends in the production of jet engines in England and to thus supplement similar data on the German aircraft industry which had been compiled by the Air Documents Division of Army Air Forces Intelligence (2) successor to the Air Documents Research Center of A-2, USAFE. Due to the short period of time allotted to this mission no extensive studies of any one phase was possible, nor did the nature of these visits entail the examination of design details. For this reason this report is limited to a general discussion of the economic and technical problems concerning production, touching upon only such design features as appear of particular significance in this respect. The plants visited were Joseph Lucas, Ltd., Rolls-Royce, Ltd., De Haviland, Ltd., Royal Aircraft Establishment, and Power Jets (Research and Development), Ltd. Drawings and photographs are included.

German

PB 25741. BERNARDS, FRANZ P. E. H. Report and correspondence regarding the construction of the combustion chamber of V - 2. (BIOS Halstead Exploiting Centre Rept 601). Sep 1945. 33 p. Price: Microfilm-$1.00 - Photostat-$3.00
This report was written at the request of Army interrogators by Franz P.E.H. Bernards, a "workshop engineer" who worked out many of the practical problems of mass production in the design and production of the A-4 or V-2 rocket, especially in the development of the combustion chamber. Workshop practice and procedure in the use and treatment of metals, especially light metals, and the large amount of welding, including atomic hydrogen, butt and projection welding, the use of forming and metal spinning, mandrel cutting, rolling, flanging, and "stretch-drawing" are all explained with reasons for their employment. The use of templates, jigs and fixtures in welding and other processes, indicates a high degree of ingenuity and an abundance of ideas on new ways to accomplish fabrication processes. The design of the double shell for the rocket, the head, combustion chamber, fuel and oxygen jets and fuel tank, with practical reasons for their design and performance characteristics, are interspersed throughout the report. Sketch drawings showing design details are included.

PB 25010. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Life periods of some ceramic nozzles - sketch of nozzles. (Halstead Exploiting Centre Rept 544). n.d. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
This report consists of a descriptive table and a drawing of a number of rocket jets.

PB 25000. BRITISH INTELLIGENCE OBJECTIVES SUB-COMMITTEE. Report on experiments with rocket motor chambers for oxygen and Diesel oil. (Halstead Exploiting Centre Rept 561). n.d. 20 p. Price: Microfilm-50¢ - Photostat-$2.00
This report is a copy in English of a German report, the author of which is not given. The report deals with the influence of the volume of the combustion chamber on performance. The contents include an introduction and statement of the problem, experimental procedure and results, theoretical basis and summary. Tables, calculations, formulas and index of terms.

PB 25042. EHRICKE, KRAFFT. Account by Ingenieur Krafft Ehricke of his work in the field of rocket development. (BIOS Halstead Exploiting Centre Rept 10047). Jan 1946. 8 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translation from the German, Krafft Ehricke is a German scientist who had done important work on rocket-propelled missiles during his lifetime and during the war since May 1942 at the Peenemünde rocket center. Ehricke states he did a great deal of work on the V-2 as assistant to the director. Many of his ideas are expressed in this narrative account of his work. There is also appended a list of scientists who worked at the Peenemünde center. Ehricke worked on the Wasserfall (Gerät C2), "Taifun" and "Schmetterling". He collaborated in the work of extracting the most important facts on all rockets built so far and in ascertaining basic formulas for the best design of a rocket. Ehricke emphasizes the fuel and fuel supply of a rocket in this report.

PB 26120. KEB, G. O. Fundamental explanation concerning: H.E. - propulsion for flying bombs. (BIOS Halstead Exploiting Centre Rept 319). n.d. 12 p. Price: Microfilm-50¢ - Photostat-$1.00
The theory of using nitric-sulphuric acid and hydrocarbon for the propulsion of projectiles is discussed and a method is described in detail in this English translation of a German document. In this process nitric-sulphuric acid and hydrocarbon to be nitrated are placed in a projectile, each having a separate tank. From these tanks pipe-lines lead to sets of jet-nozzles mounted to the reinforced base on the outside of the projectile. The jet nozzles are arranged in circular fashion in such a manner that one for hydrocarbon alternates with one for nitric-sulphuric acid, the jet axis of the nozzles pointing to the center of the projectile base. The flight stabilization of the projectile takes place by an electrically-driven gyroscopic installation. Further description of the various parts of this projectile and its operation are given, also a drawing.

PB 25305. FELKIN, S. D. Information received from P/W: Remotely controlled A.A. projectile Wasserfall, Remotely controlled missiles (Henschel Flugzeugwerke A.G.), Remotely controlled missiles (Ruhrstahl A.G. Bielefeld), Remotely controlled A.A. projectile Enzian, Trends in development of German weapons for countering the allied bomber. (BIOS Halstead Exploiting Centre Rept 5790) Apr 1945. 60 p. Price: Microfilm - $1.00 - Photostat - $4.00
The information contained in the five reports presented herein was obtained through interrogation of prisoners of war who had been closely connected with the development remotely controlled missiles in Germany. Report I consists of a general account of the history of anti-aircraft rockets in Germany since 1942 followed by a history and description of the weapon known as "Wasserfall" which had been developed by Rheinmetall Borsig, of Zwickau (Bohemia). This was designed as a supersonic rocket, radio controlled, fired vertically from the ground. The projectile weighted about four metric tons, including 1.5 tons of steel alloys, and two tons of liquid rocket-fuel. About thirty test launchings were made but the development had not been completed when the war ended. Report II is based on information obtained from Professor Herbert Wagner, a director of research of the Henschel Flugzeugwerke A. G. and contains an account of the weapons which he developed. Radio control of the missiles is not dealt with here. By incorporating the Walther bi-fuel propulsion unit with the Schwarz glide bomb a new missile was developed which was designated the Hs.293. This was provided with a fixed fin and ailerons. From 1940 to 1944 Professor Wagner developed a series of nine subtypes of the Hs. 293 as well as five other missiles, all of which were originally to be powered with the Walther unit. These missiles are briefly described. Report II contains information on the research and development of remotely controlled missiles by Ruhrstahl A.G., of Bielefeld, obtained through interrogation of Dr. Kramer of that company. The report indicates that work on the bombs had been suspended in favor of the two defensive weapons, the X-4 and X-7. The X-4 is an anti-bomber missile designed to be carried by fighters and X-7 was designed in an effort to scale down the weight of the X-4. Report IV describes the development of the German anti-aircraft projectile "Enzian" developed under the auspices of the Sonthofen detachment of TLR Flak E5. This was a rocket-propelled, remotely controlled missile in the form of a pilotless aircraft with monocoque fuselage and was intended particularly for use against heavy bomber formations. It was fired from a launching platform on the ground and was the most powerful Flak rocket developed in Germany. All development work was stopped in March 1945, however. The information in Report V was obtained from men who were in a position to know the most recent trends of development in weapons to counter the Allied bomber attacks on Germany. For some time these trends had been in the direction of remotely controlled explosive missiles, launched against the bombers from the air or the ground. A brief description of these weapons and their intended uses is given. The detailed descriptions of the numerous missiles considered in these reports are accompanied by drawings.

PB 25037. FELKIN, S. D. The work of the G.A.F. experimental station at Peenemünde-Karlshagen in the field of guided projectiles - I and II. (BIOS Halstead Exploiting Centre Rept 5793) Oct - Nov 1945. 38 p. Price: Microfilm - 50¢ - Photostat - $3.00
Part I confines itself to an account of the organization and working methods of the Karlshagen research station which evaluated new devices of air armament before such weapons were introduced in the G.A.F., and tested special secret weapons. Part II presents comments on the guided projectiles which passed through the station, and the practical difficulties which arose during their testing. Information is included on: The Hs.293D, a missile with a television head; jamming; the X-4, a remote-controlled inter-aircraft rocket projectile to be launched from fighters; the "Natter", a manual interceptor fitted with the Ms. 163B power unit and launched from a mounting; Hs. 117, a radio-controlled flak rocket; and a B.V. 246, a self-directing glide bomb.

PB 25301. GUDERLEY, G. Jet propulsion. (BIOS Halstead Exploiting Centre Rept 10252). 1929. 15 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translation of a German report on jet propulsion including an introduction, general statements, calculation of jet propulsion and a treatment of the combustion process. Jet units are divided by the author in the following manner: (1) Jet units not using the surrounding air (rockets) (2) Jet units using the surrounding air by (a) continuous propulsion and (b) periodic propulsion (3) Using the reaction of the exhaust gases of the motor. These various types are illustrated with drawings. In the calculations of jet propulsion and the combustion process, the values assigned the various factors are given; however, the actual formulas were not embodied in this report.

PB 22787. MÜLLER, K. J. Theoretische untersuchungen über kühlung von gas turbinen. (Theoretical investigations on cooling of gas turbines). (David W. Taylor Model Basin Translation 198; Deutsche Luftfahrtforschung FB 1918). Mar 1946. 38 p. Price: Microfilm-50¢ - Photostat-$3.00
Operation at very high gas temperatures in gas turbines can be achieved by cooling of the structural parts. Among the various cooling methods, internal cooling of hollow runners by air and liquids, cooling by circulating or surrounding the blade system with thin air strata and admission cooling are discussed. Problems of temperature distribution and thermal stresses in the endangered parts and also cooling losses, i.e., loss of net plant work the resulting reduction of net plant work to cover the circulation of the cooling agent particularly are treated. The fundamental theory, assumption and derivations are outlined. Graphs and a list of references, in German, are included.

PB 25004. NEWMAN and WISEMAN, L. A. Interrogation of Hans Pucher of the Staasfurter Rundfunkgesellschaft. (BIOS Halstead Exploiting Centre Rept 563). Jul 1945. 6 p. Price: Microfilm-50¢ - Photostat-$1.00
This report concerns guided missles. The wire and radio control systems of the following missiles are breifly described: HS293FI (plane to ship) X4 and HS298 (plane to plane) and HS117 (Schnetterling), Wasserfall, Rheintochter and Enzian (ground to plane).

PB 25115. SCHACHT. Works on operational stations (airfields). (BIOS Halstead Exploiting Centre Rept 234). Apr 1944. 10 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translation from the German of Report LIII by Klotz. Part of the original text and illustrations are missing. It covers experience in assisted-take-off with the apparatus RI202b in Montpellier and Salon and with the apparatus RI203b or RI210b at Biscarosse (seaplane operational station). Release of the apparatus immediately after use is important and the apparatus must be salved if possible. Some hints are given in this connection.

PB 27755. TRAUEN. Size and shape of rocket - combustion - chamber. (BIOS Halstead Exploiting Centre Rept 10555). n.d. 16 p. Price: Microfilm-$1.00 - Photostat-$2.00
Earlier common construction of rocket combustion chambers provided for spraying, mixing, and preheating of the fuel and oxidant directly in the combustion chamber. This gave constructional difficulties and caused the injectors to be burnt out. In order to use the combustion chamber only for the reaction, several methods of mixing and spraying the two substances before, or just as they enter the chamber have been tried, and various types of spraying and mixing nozzles and their arrangement are described and evaluated herein. The shape of the chamber should be so constructed that a large flame front is possible., i.e., with no concentration of inflowing fluids, but distribution among many single inlets. The spherical form of chamber with mixing nozzles arranged in the periphery is theoretically the best. Constructionally, however, it presents great difficulty. A short cylindrical chamber with the nozzles arranged at the end might be used. A short cylindrical chamber with a cone shaped end would have the best shape for quick combustion. Long chambers of relatively small diameter have a large heat transfer outwards due to the necessary cooling of the walls of the chamber. Theoretical discussion of the velocity of combustion and the internal pressure on which the size of the chamber depends is given. This English translation of a German report also includes theoretical discussion of the principles involved in the functioning of the rocket combustion chamber and a number of drawings and plotted curves.

PB 25114. VANE, C., tr. Life-test on Geraet 109 - 509 A - 0 to test the welding of the fuel head. (BIOS Halstead Exploiting Centre Rept 232). Aug 1944. 4 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translation from the German on results of endurance trials on engine No. 109 - 509A-0 with propelling gear No. 1769 and with combustion head welded to the chamber. It was concluded that the combustion-head if welded on can be used for a fuel feed of up to 80 to.

PB 25116. WALTER, H., LTD., KIEL. Provisional handbook of description of construction and instruction for use for units: 109 - 501 and 109 - 502. (BIOS Halstead Exploiting Centre Rept 231). n.d. 29 p. Price: Microfilm-50¢ - Photostat-$2.00
This is a translation from the German by Langguth describing the devices 109-501A1 (1500 kg thrust during 30 seconds) and 109-502A1 (1000 kg thrust during 42 seconds) which assist aircraft take-off according to the rocket principle. Mode of operation, instructions for changing, adjusting and testing individual constructional groups and for use and maintenance and schemes of testing and sequence of the control movements after each run and of operation are given. The devices are suspended in pairs in special fittings under the wings and dropped by parachute after the take-off.

PB 25118. WALTER, H., LTD., KIEL. Report on A 1.438. Experiments with low combustion chamber pressure. System T - fuel, Z - fuel, petrol with Bertolin preliminary running. (BIOS Halstead Exploiting Centre Rept 229). Apr 1942. 5 p. Price: Microfilm-50¢ - Photostat- $1.00
This report in English is signed by Bartelsen. It reports experiments to establish to what combustion chamber pressure the combustion initiated by means of Bertolin can be maintained with T-fuel, Z-fuel and petrol and whether, with small charges, the cooling down of the combustion chamber by T-fuel is possible. The combustion of petrol up to 4.1 of pressure combustion chamber and 720°C. after being initiated by priming remains constant.

PB 25109. WALTER, H., LTD., KIEL. Report on combustion with the two fuel system in a combustion chamber provided with throttle. (BIOS Halstead Exploiting Centre Rept 222). Apr 1942. 3 p. Price: Microfilm-50¢ - Photostat-$1.00
This report describes an investigation of combustion properties at different feed rates in a combustion chamber for the T5 u-two fuel system. With the concentration of Ingolin of 45% a fuel ratio 60:40, and with a temperature of about 700° C., excellent combustion properties were attained. The combustion properties hitherto obtained from the series-type combustion chamber yielded an average CO_2 content in the exhaust gases of about 34%; that is, about 70% of the maximum possible CO_2 content. The original Experiment Report 222 in German is appended to the English translation.

PB 25110. WALTER, H., LTD., KIEL. Research report on two-component fuel systems. (BIOS Halstead Exploiting Centre Rept 220). Jan 1942. 2 p. Price: Microfilm-50¢ - Photostat-$1.00
This is a translation from the German by Mrs. Minahan. In research on 2-component fuel systems the following points arose: (1) The copper content of the fuel, in a colloidal solution may be regarded as decisive with regard to ignitability, (2) unobjectionable ignition is possible with the Ingolin supply turned on by hand up to 1 sec. before the fuel, and, apart from small pressure peaks, no observable damage occurred to the installation.

MARINE TRANSPORTATION

PB 26818. MEYER, G. A. Report on development of German shipping from 1800 to 1939. (FIAT Final Rept 775). Mar 1946. 15 p. Price: Microfilm-$1.00 - Photostat-$1.00
A short general history of the development of German shipping from 1800 to 1939 giving an overall picture of how the German merchant marine was built up to World War I and how quickly it recovered thereafter. These data and figures were secured by interrogating Messrs. Herman Helms of the Hansa Steamship Line and Richard Bertram of the North German Lloyd. Tables are attached.

PB 27605. NATHAN, BENNO, tr. The individual pneumatic life raft. (AAF AMC T-2 Translation 568) Apr 1946. 28 p. Price: Microfilm-$1.00 - Photostat-$2.00
This is an English translation of a German instruction book. It describes an equipment for sea rescue of crews of fighters, bombers and dive bombers or combat aircrafts, when descent by parachute is preferred to emergency ditching. It is packed in a carrying case which at the same time is the back pad of the parachute pack; it is fastened to the body with two straps and remains attached to the body after the shedding of the parachute. It must be used with back-free types of life preserver vests. Description in detail is given of the equipment, its operation and maintenance, and packing instructions. A number of photographs illustrate the packing and operation of the life raft.

PB 25405. SPARROWS AND STEPHENS, INC., NEW YORK. Development and tests of the ¼ ton 4 x 4 GPA amphibian (QMC4). Final report. (OSRD Rept 4031). Jul 1944. 57 p. Price: Microfilm-$2.00 - Photostat-$4.00
This report briefly summarizes the participation of subject firm in the development of the following projects: No. 408, 1/4-ton 4 x 4 amphibian; No. 433, Light tank flotation; No. 435, "Pelican" 6-ton amphibian; No. 437, "Weasel" snow vehicle; No. 439 Amphibious trailer; No. 449, Tractor - trailer, amphibious; No. 460, "Pelican" final studies; No. 462, "Ark" amphibious conversion of "Weasel" M-29 light cargo carrier; and No. 479, Pontons for vehicle flotation. "Pelican" designations were applied to all amphibians larger than the DUKW 2½ ton, 6 x 6. Working drawings and illustrations are included.

PB 26383. STEPHENS, RODERICK, JR. Report on trip to United Kingdom May 9 to July 1st, re DUKWS. Jul 1943. 19 p. Price: Microfilm-$1.00 - Photostat-$2.00
This report covers early DUKW training at Camp Dundonald in Scotland. Copies of the instruction sheets distributed are attached: (1) Provisions for DUKW mooring at ship-side (including sketches); (2) combat re-shipment of DUKWS; (3) DUKW amphibian maintenance sheets consisting of (a) daily task sheet, (b) weekly task sheet, (c) monthly task instructions for handling DUKWS on shipboard; (4) temporary DUKW A-frames; (5) general suggestions regarding DUKWS.

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